Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Annual Assessment of the Status of	)	MB Docket No. 04-227
Competition in the Market for the	)	
Delivery of Video Programming	)	

COMMENTS OF THE CONSUMER ELECTRONICS ASSOCIATION

The Consumer Electronics Association ("CEA") submits these comments in response to the Notice of Inquiry ("NOI") in the above-captioned proceeding.[1] In the NOI, the Commission solicits data and information on the status of competition in the video programming delivery market for its annual report to Congress, as required by statute.[2] We are pleased to respond to the Commission's video equipment and related questions.

INTRODUCTION

The transition from analog to digital television by equipment manufacturers, cable operators, terrestrial broadcasters, satellite broadcasters and home media is at the center of the market for delivery of video programming. As the digital service market continues to grow, success in this market increasingly drives results between and among competitors.

To date, the transition has been a resounding success for equipment manufacturers, suppliers, and the consumers they serve. Digital television ("DTV") sets, and high definition television ("HDTV") sets in particular, are among the fastest selling products in consumer

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[1] *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming,* MB Docket No. 04-227, *Notice of Inquiry*, 69 Fed. Reg. 39930 (2004) ("NOI").

[2] *See* 47 U.S.C. § 548(g).

electronics history. We forecast that this already-rapid introduction will accelerate with the introduction of digital cable ready ("DCR") and over-the-air ("OTA") integrated DTV sets.

While successful consumer equipment sales are helping to accelerate the transition to digital, and cable operators and satellite programmers provide increasing numbers of HDTV channels, consumers need more information about the availability of OTA digital broadcasts. The digital broadcast channels need to be promoted more aggressively, both during analog broadcasts and in TV program listings. CEA conducts numerous programs to increase public knowledge about the DTV transition and broadcast reception in particular, and now is the time for broadcasters to increase their efforts as well by running public service announcements ("PSAs") and similar promotions. The majority of commercial broadcast stations that continue to operate at less than full power, or are not on the air at all, especially need to fully construct their facilities to reach all the viewers of their analog signal with a digital signal. Cable operators, for their part, must support Digital Cable Ready ("DCR") integrated television sets with adequate stocks of CableCARDS to provide a seamless viewing experience for new digital viewers.

The Commission has multiple proceedings pending that address various aspects of the digital broadcast transition.[3] The FCC should strive to conclude these proceedings promptly so that the marketplace has regulatory certainty, and the 108 megahertz of spectrum currently occupied by broadcasters on channels 52-69 can be reclaimed rapidly to meet the increasing demands for public safety and wireless services.

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[3] *See, e.g., Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television,* Notice of Proposed Rulemaking, 18 FCC Rcd 1279 (2003); *Carriage of Digital Broadcast Signals,* First Report and Order and Further Notice of Proposed Rulemaking, 16 FCC Rcd 2598 (2001); *Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations,* Notice of Proposed Rulemaking, 18 FCC Rcd 18365 (2003).

THE CONSUMER ELECTRONICS ASSOCIATION

The Consumer Electronics Association is the principal U.S. trade association of the consumer electronics and information technologies industries. Our members design, manufacture, distribute and sell digital and analog television receivers and monitors and associated electronics, digital video recorders ("DVRs"), video cassette recorders ("VCRs"), direct broadcast satellite radios ("DARS") and television receivers ("DBS"), broadcast AM and FM radios, and similar equipment. Our members also design and manufacture unlicensed devices such as Wi-Fi network devices that connect personal computers, personal digital assistants ("PDAs") and laptops to peripheral devices and networks, cordless phones, baby monitors, and wireless headsets. CEA's more than 1,700 member companies include the world's leading consumer electronics manufacturers.

CEA collects and aggregates market research information on a regular basis from a variety of sources. We are pleased to provide the information below in response to the Commission's NOI.

DIGITAL CONSUMER DEVICES PERVADE THE MARKETPLACE

In the NOI, the Commission requests information on the availability and compatibility of equipment used to provide video programming and other services to consumers, including the number of households that have analog television sets and the number that have digital television sets.[4] Digital consumer devices pervade the marketplace. Digital television ("DTV") sets, and high definition DTV sets ("HDTV") in particular, are some of the fastest selling products in consumer electronics history.

[4] NOI at ¶ 31.

There are 110 million households in the United States, of which 104 million have at least one television ("TV") set, or more than 98 percent of all households. There are an estimated 287 million TV sets in the United States, or an average of 2.72 sets per TV household. Households with more than one TV set number approximately 88 million, or approximately 80 percent.

The Commission also requests information on the number of households that have digital television sets and associated digital set-top boxes.[5] Through May, 2004, over 11 million individual DTV products have been sold to consumers. The amount invested by consumers in these products exceeds $20 billion, and the pace of DTV product sales is increasing rapidly. Based on CEA's factory-to-U.S.-dealer shipment data, we estimate that today 9.5 million TV households have at least one digital television set or monitor. Of these sets, approximately 1.3 million have OTA DTV broadcast reception capability. [6] We expect the percentage of sets with OTA capability to increase steadily because DCR sets with integrated OTA reception are now entering the market in volume and the Commission's terrestrial DTV tuner requirement has now taken effect.

The uptake on digital products is so strong that CEA consistently has revised upward its projections for DTV sales.[7] We now predict that 5.9 million units will be sold in 2004, 9.74 million in 2005, 16.2 million in 2006 and 23.9 million in 2007.[8]

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[5] S*upra* note 4.

[6] Based on CEA's factory-to-U.S.-dealer shipment data and consumer surveys, approximately 600,000 DTV sets and 660,000 set-top boxes that include DTV tuners have been sold.

[7] CEA defines DTV products as integrated sets and monitors displaying active vertical scanning lines of at least 480p and, in the case of integrated sets, receiving and decoding ATSC terrestrial digital broadcasts.

[8] *See* CEA Press Release, *After Record-Breaking First Quarter, April Sales Continue the DTV Climb*, dated June 16, 2004. This compares to our prediction last year that 5.8 million would be sold in 2004, 8.3 million in 2005, 11.9 million in 2006 and 16.2 million in 2007, *see* CEA Comments in MB Docket No. 03-172 at 4 (dated Sept. 11, 2003). The figures above represent an update based upon year-to-date trends.

The depth of competition in the equipment marketplace is illustrated by the receivers and monitors being distributed for sale. As multiple manufacturers compete for sales, consumers are purchasing an increasing number of digital receivers and video monitors. Digital receivers and monitors dominate store displays. CEA estimates that today manufacturers make more than 240 models of flat-panel HDTV monitors under more than 55 brand names. Manufacturers also are making more than 115 models of integrated HDTV receivers that need no external tuner for broadcast reception, and there are 15 brands of digital set-top decoders.[9] Depending on the model, these set-top decoders allow reception of high-definition programming from OTA broadcasters and either cable systems or direct broadcast satellite providers for display on a television receiver or monitor.

Manufacturers also are offering more than 600 models of HDTV digital monitors. There also are 24 models of digital TV set-top decoders being offered that provide digital OTA reception. [10] High-definition recording equipment and cable, satellite and terrestrial set-top boxes that incorporate OTA reception and digital video recorders ("DVRs") also are beginning to appear.

The Commission also asks for information on the number or percentage of households with videocassette recorders, laser disc players, DVD players, and DVRs. According to CEA research, 100 million U.S. households, or 92.7 percent of all TV households, have a videocassette recorders ("VCR"). As of July 2004, nearly 100 million DVD players had been sold since being introduced, and approximately 77 million households in the U.S. have a DVD player. In addition. approximately 1.9 million DVRs have been sold to date.

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[9] *See* The Consumer Electronics Association's *HDTV Guide*, Spring 2004 ("HDTV Guide").

[10] *Id.*

HIGH DEFINITION PROGRAMMING DRIVES THE DTV BROADCAST TRANSITION

In the NOI, the Commission requests information regarding the amount and type of programming being offered in HDTV format, both broadcast and non-broadcast.[11] Cable and DBS both provide multiple full-time 24-hour HDTV channels. The cable industry reports that as of March 31, 2004, it offers high definition channels to 84 million households.[12] Many of the high definition channels available on cable also are transmitted nationally by EchoStar and DirecTV, the two DBS providers. Both transmit 5 or more full-time HDTV channels, and EchoStar has requested permission to deliver to unserved areas the high-definition programming of the major broadcast networks.[13] Legislation also is pending before the Congress to statutorily authorize such carriage.[14] CEA supports these efforts to allow satellite broadcasters to deliver network high definition programming to consumers who otherwise cannot receive it over-the-air.[15]

Under the channel allotment scheme adopted by the Commission to facilitate the broadcast DTV transition, viewers who receive a station's analog signal should be able to receive that same station's digital signal, provided that the station uses the full digital facilities permitted by the FCC. However, most commercial broadcasters are using less power than authorized for their digital signals and in too many cases cover only a portion of their stations' analog service areas. As a consequence, many consumers nationwide can receive a station's analog signal but

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[11] NOI at ¶ 60.

[12] *See* National Cable & Telecommunications Assoc., *2004 Mid-Year Industry Overview* at 1.

[13] *See* Letters from Pantelis Michalopoulos, Counsel for EchoStar Satellite, LLC, to FCC Chairman Michael K. Powell (Mar. 4, 2004 and Apr. 13, 2004). Both letters are filed in MB Docket No. 03-15.

[14] *See* S. 2644, 108 Cong. 2d. Sess. (2004).

[15] *See* CEA press releases: *CEA Backs Satellite White Area Bill* (July 15, 2004); *CEA Applauds Senate Commerce Committee Vote in Favor of Satellite Service to Digital White Areas* (July 22, 2004).

not the station's digital signal. Many other consumers are receiving less-than-optimum reception because DTV tuners were designed to operate with full power signals. By the Commission's own figures, a majority of the stations on the air with digital signals today continue to use facilities that provide less coverage than their analog signals.[16] With millions of DTV tuners entering the marketplace in response to the FCC's rules, it is more imperative than ever that the Commission ensure that all broadcasters are on their permanent digital channels and operating their digital stations at full power by no later than January 1, 2006.

CONSUMER EDUCATION

Consumers need more information regarding the availability of OTA digital broadcasts. Digital broadcasts need to be promoted more aggressively during both analog broadcasts and in TV program listings. CEA conducts numerous programs to increase public knowledge about the DTV transition and broadcast reception in particular,[17] and urges that more efforts throughout the industry are needed to complete the digital transition within a reasonable time.

Among its educational efforts for DTV, CEA operates two websites that promote the DTV transition through consumer and dealer education. One of these websites specifically permits consumers and salespeople to determine the DTV signals that can be received at their location and what type of antenna is needed to do so. This website is http://www.antennaweb.org. CEA also maintains another website at http://www.ceknowhow.org, where retail salespeople and others can obtain in-depth training about digital TV terminology, products and capabilities.

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[16] According to FCC figures, as of June 30, 2004 (more than two years after the May 1, 2002, construction deadline for commercial DTV broadcast stations) only 34.7 percent of commercial DTV broadcast stations have been constructed with full facilities and placed on air (456 out of 1315); 12.7 percent have not been placed on the air at all (167 stations); and 52.6 percent are on the air but with facilities, the majority of which are authorized by special temporary authority ("STA"), that fail to replicate the stations' analog service area. *See* FCC, *DTV Stations Authorized to be on the Air, June 30, 2004*, at http://www.fcc.gov/mb/video/files/dtvonairsum.html (visited July 16, 2004).

[17] Examples of CEA materials are at Appendix D.

CEA also publishes a number of articles to educate consumers and retailers. In December 2003, CEA purchased national coverage in *TV Guide* for a multi-page *Home Entertainment Buyers' Guide* to explain DTV to viewers and describe the kinds of reception equipment available to them. In June, 2004, a similar special section was run in *Sports Illustrated*.[18] Working with Comcast, CEA also published an educational DVD and booklet *A Consumer's Guide to the Wonderful World of HDTV* that explains the DTV transition and makes practical suggestions for selecting and purchasing suitable reception equipment.[19] In addition, CEA designed, printed, and has made available to retailers a "tip sheet" or card that explains the DTV transition and basic DTV terms and technology.[20] These efforts are helping to educate consumers about DTV, and we hope that others will join us in aggressively informing viewers about the digital transition in these and future planned efforts.

CABLE COMPATIBILITY

CEA's members designed, manufactured, and have just begun selling DCR television sets that should be compatible with most cable systems around the country. These digital cable ready sets have OTA integrated DTV tuners as well as cable tuners. In order to use the DCR sets with most cable systems, however, the consumer first must obtain a CableCARD containing security and other circuitry for particular local cable systems. This requires cable operators to make available a sufficient supply of reliable and robust CableCARDS in a fast, simple, and consumer-friendly manner. To the extent that the cable operators elect to charge for the CableCARDS, they should be easily available at a reasonable price that is significantly less than that charged for a set-top box.

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[18] Copies of these published supplements are attached at Appendix A.

[19] A copy of *A Consumer's Guide to the Wonderful World of HDTV* is attached at Appendix B.

[20] A copy of this card is attached at Appendix C.

The only way to assure competitive supply of digital cable set-top boxes and digital cable ready TV sets is to ensure that the devices supplied by cable operators rely on the **same** CableCARDS for security that must be used by equipment supplied through competitive retail outlets. This not only will assure a steady supply of CableCARDS, but also will provide incentive for cable operators to keep the CableCARD system reliable, up-to-date, and competitive with their own embedded security system. The Commission must ensure the integrity of its regulation concerning these devices and maintain July 1, 2006, as the date by which digital devices supplied by cable operators must meet these requirements.[21]

CONCLUSION

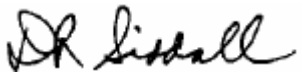
The transition from analog to digital by equipment manufacturers, cable operators, satellite broadcasters, terrestrial broadcasters, and home media is at the center of the market for delivery of video programming. To date, the transition has been a resounding success for equipment manufacturers, suppliers, and the consumers they serve. Nevertheless, consumers need more information regarding OTA digital broadcasts.

Competition in the market for delivery of video programming will be strengthened by the digital transition if the digital broadcast channels are promoted more aggressively, both during analog broadcasts and in TV program listings, and broadcast stations fully construct their facilities to reach all the viewers of their analog signal with a digital signal. Cable operators must support Digital Cable Ready ("DCR") integrated television sets with adequate supplies of CableCARDS in order to provide a seamless viewing experience for new digital viewers. The

[21] *See Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices and Compatibility Between Cable Systems and Consumer Electronics Equipment*, CS Docket No. 97-80 and PP Docket No. 00-67, Report and Order, 13 FCC Rcd 14775 (1998), Second Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd 20885 (2003), petitions for reconsideration pending, 69 Fed. Reg. 3361 (2004).

FCC also should conclude its multiple pending proceedings that address the broadcast DTV transition, including the Second Periodic Review and Cable Carriage dockets.

Respectfully Submitted,



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July 23, 2004

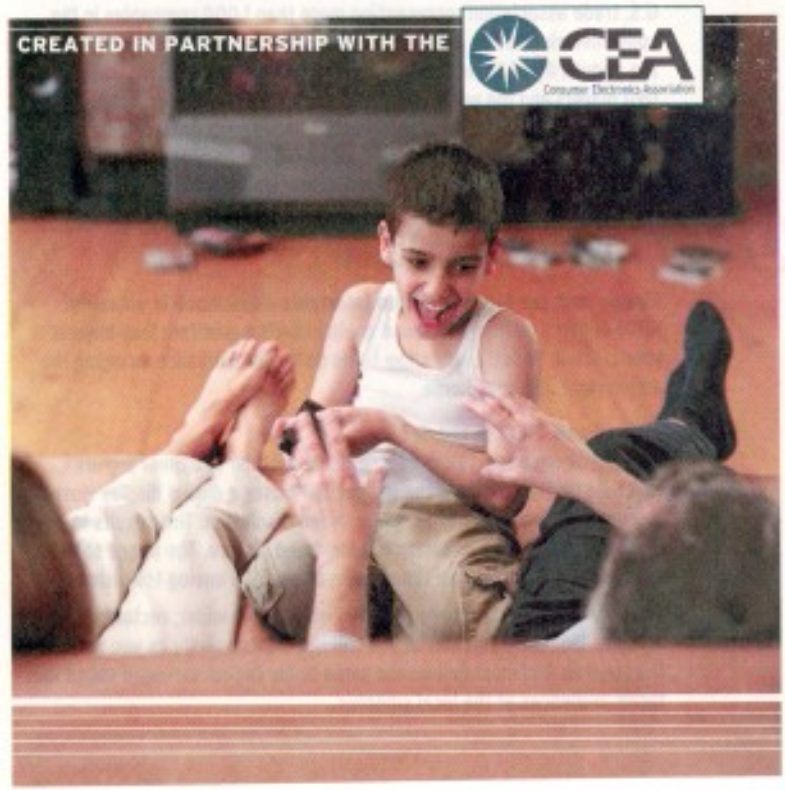
APPENDIX A

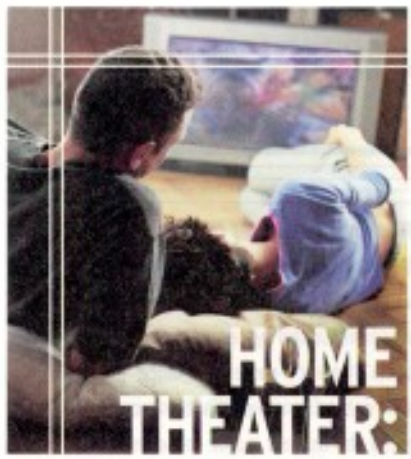
HOME ENTERTAINMENT BUYERS' GUIDE

THE FUTURE IS NOW

Thanks to the latest advances in home entertainment technology, your favorite TV shows and Hollywood blockbusters have never looked better!

Wouldn't it be great to have the movie experience at home – a beautiful wide screen, glorious surround-sound system and cushy seats? Now it's easier and more affordable than ever. Whether you enjoy the hottest movie releases, prime-time favorites, soap operas or action-packed sports, watching them on your own home theater takes home entertainment to the next level. ▶





HOME THEATER: EXPERIENCE TELEVISION LIKE NEVER BEFORE

"Millions of Americans have embraced the home theater experience with a passion. Once people see the big, beautiful picture and hear the great sound, they want one in their living rooms," said Gary Shapiro, president and CEO of the Consumer Electronics Association (CEA), the U.S. trade association representing more than 1,000 companies in the consumer electronics industry. "Three of the biggest forces driving the popularity of home theater are high-definition television (HDTV), DVD players and the wealth of simple home theater-in-a-box solutions available," Shapiro said. "Manufacturers are driving down prices, improving quality and making technology easier to use, a 'perfect storm' for everyone who loves home entertainment."

THE BIG PICTURE

Simply put: the high-definition television experience is amazing. HDTV delivers picture and sound quality that's a quantum leap beyond your current TV set. Every show takes on a vivid brilliance, bringing the action right into your home.

How does HDTV work?

A conventional analog TV uses a cathode ray tube to deliver pictures, which limits the quality of the image. HDTV uses a digital display—just like a computer monitor—with a higher screen resolution. This results in a much crisper, clearer, dramatically improved picture. The image seen on the best HDTV set has five times more detail than analog televisions.

Not only is the picture more realistic, HDTVs have wider, rectangular screens like movie screens so you will see a film exactly as you would in the theater. And most deliver the same Dolby Digital surround sound that thrills audiences at the local cineplex.

How do I receive HDTV?

It's simple and just like your current TV. You can receive it either over the air with an antenna, by satellite dish or via your cable system.

If you want over-the-air reception, you will need an antenna. To find out what antenna works for your home—rooftop or indoors, use the CEA map program located at **www.antennaweb.org.**

To receive via satellite, you will need a specific receiver as well as a special satellite dish. Both are readily available from local electronics retailers. DIRECTV, DISH Network and VOOM are actively promoting their HDTV services. See your dealer or their web sites for more detail.

If you want HDTV from your local cable provider, you will have to use a special set-top box supplied by the company for rent or purchase. Call your cable provider to inquire about HDTV service in your area.

What programming is available in HDTV?

Viewers have access to a multitude of HDTV shows, from broadcast programming (*Alias, Everybody Loves Raymond, ER, Smallville*) to high-profile awards shows (*Academy Awards*) and sporting events (*Super Bowl*). And a new HDTV is also a great companion for the many progressive scan DVD players available. Connect one to your set and you will experience a beautiful, seamless image. With an endless array of DVD titles—and thousands of hours of television—there's no shortage of entertainment.

ANALOG TV | OUT WITH THE OLD?

Analog televisions will continue to receive analog broadcasts at least through 2006 and possibly longer. After that, consumers will be able to connect an inexpensive set-top box to their existing TV to receive digital TV broadcast signals, but not in high definition. Of course, current televisions will still work with cable, satellite, VCRs, DVD players, camcorders, video game consoles and other devices for many years.

HDTV 101

Don't know your analog from your DTV? Before going to the store, make sure you are HDTV-savvy with these basic terms:

Analog TV Today's television system which uses magnetic waves to transmit and display pictures and sound.

Aspect Ratio Refers to the width of a picture relative to its height. Traditional TV has a 4:3 aspect ratio. HDTV has a 16:9.

Digital Television (DTV) Television delivered and displayed using computer code (digital technology). DTV is the umbrella term for three different quality levels of television—standard-, enhanced- and high-definition.

Enhanced-Definition Television (EDTV) Better digital television, with at least 480 progressive (p) scanning lines in a 16:9 or 4:3 format. Includes Dolby Digital surround sound.

High-Definition Television (HDTV) The best digital television, with at least 720 progressive (p) scanning lines or 1080 interlaced (i) lines in a 16:9 format. Includes Dolby Digital surround sound.

Interlace Scan A way to scan vertical lines onto a TV picture by scanning all the odd lines first, then filling in the even ones.

Progressive Scan A way to scan vertical lines onto a TV picture by scanning all the lines consecutively.

Standard-Definition Television (SDTV) Basic digital television, with fewer than 480 progressive (p) scanning lines in a 16:9 or 4:3 format.

Want to learn more about HDTV?

A special CEA website—**www.ce.org/hdtv**—has a wealth of information on this topic. Tune in for the latest news and updates.

THE STANLEY CUP: JOY IN TAMPA BAY

NBA HEAD GAMES: PHIL JACKSON vs. LARRY BROWN

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Sports Illustrated

Welcome Back

A Healthy, Happy KEN GRIFFEY JR. Makes His Run at 500 Home Runs

(and the Cincinnati Reds are the surprise of the season)

SPECIAL REPORT: PART I
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The NEW Big Picture

HDTV's arrival makes Sunday afternoons a whole lot better

By Mervyn Kaufman

Imagine a television nearly as wide as your wingspan with a picture almost unbelievably sharp and brilliant. How cool would that be? Oh, you've already been to the store? Then you've probably drooled over the new supersets and know that the dream of high-definition television has finally come true, in spades. If you haven't been to the store, prepare to be dazzled, but don't leave home with only your credit card and a determination to own a 21st-century TV. Take an advance look at the field and then play it to your advantage.

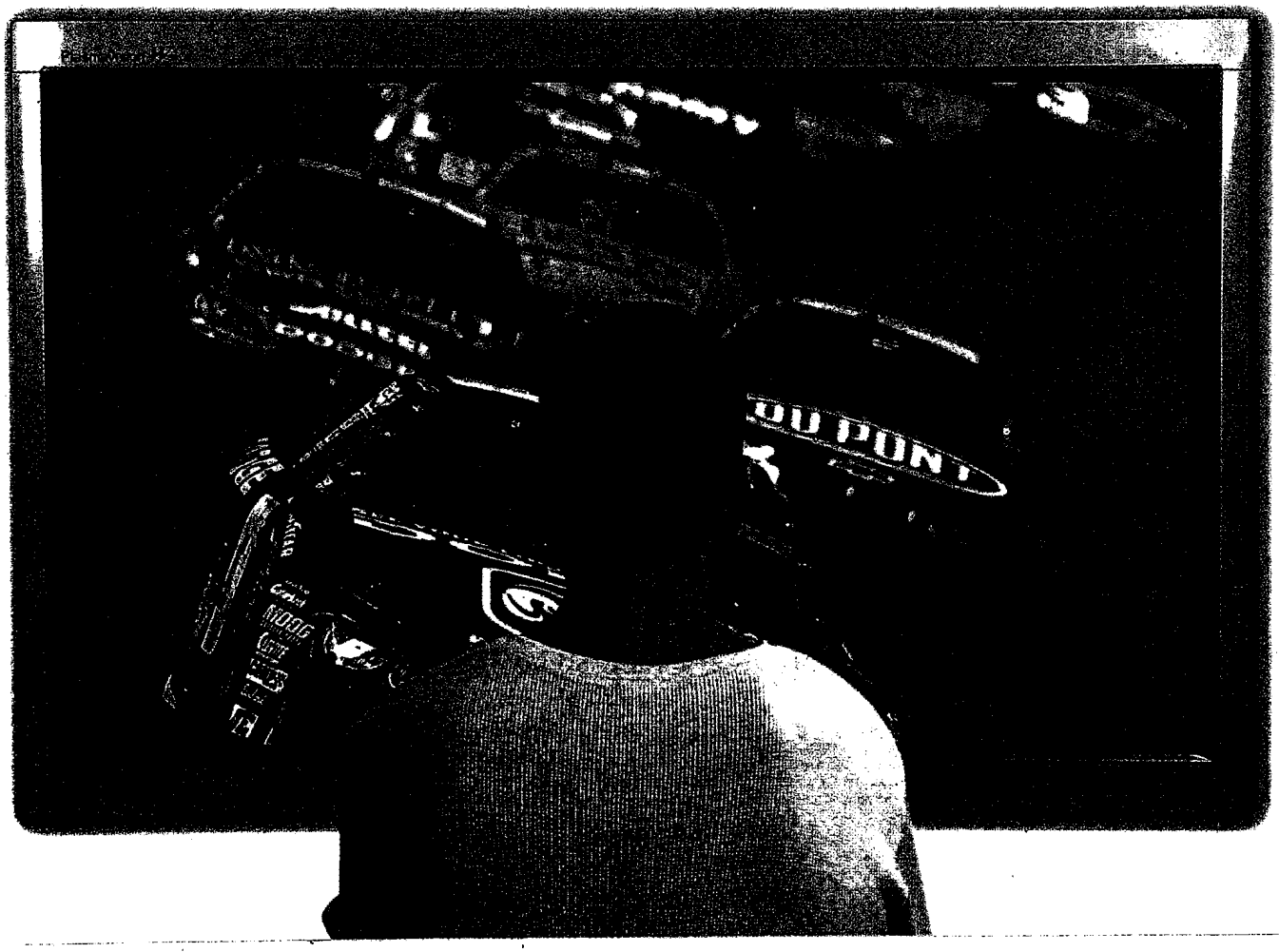
TV screens are cinematically wide, and the image is digital. The good ol' cathode-ray tube has somewhat kept pace, but some potent creations—plasma, LCD, DLP—have joined the competition to bring you your next Super Bowl. And that's where you might need a little help in figuring out which one, what size and how much to shell out.

First, a little background. Analog images beamed from cathode-ray tubes have been the standard since the dawn of television. Over the years, screen size grew and with it, cabinet size and bulk. Even though the picture got bigger, picture quality had hit a ceiling. Then came digital television, and now with it HDTV's great leap in the crispness and clarity of what you're watching.

HD is a significant step up from ED (enhanced definition), its predecessor, which itself represented a vast improvement over analog. Think good (analog), better (ED), best (HD). For years, we were told HDTV was coming but were warned it would be prohibitively expensive. Indeed, you can spend in the low five figures for the biggest size of the purportedly best technology, but you can also get excellent HD for much less. And people are buying. With factory-to-dealer sales totaling more than four million units, "2003 was a banner year for HDTV," says Gary Shapiro, president and CEO of the Consumer Electronics Association. Spend $10,000 to $20,000 if you wish, but if you have just $2,000 to $3,000, the HD experience can still be yours.

THE HIGH-DEF DIFFERENCE

For starters, high-def offers an enlarged screen size, whether you purchase a 24-inch model that sits on a table or a 60-incher that hangs on a wall. Instead of the traditional, nearly square 4:3 aspect ratio, you get a 16:9 proportion, called letterbox, similar



FUJITSU (TV); GETTY IMAGES (2)

is only about 16 inches deep compared to 25 inches for standard rear-projection.

You'll also doubtless be awed by screen measurements that go all the way to 70 inches. But you have to be careful about being seduced by size. Big is nice, but it's important to pick a TV that best fits your viewing room. If you're crammed too close to a 60-inch screen, you'll see more pixels than picture. "A good, basic rule is to triple a set's diagonal screen measurement," says Tony Favia, senior product manager of flat-panel TVs for Sharp Electronics. "If you have a 30-inch screen, you need to sit 90 inches away to enjoy optimal picture quality."

Another item on your HD shopping list will likely be a high-def tuner, and this is where you must bone up on what's happening with satellite and cable TV. Most of the sets you can buy today are labeled "HDTV-Ready" and don't have a built-in tuner to decode the incoming signal. Figure on an additional $200 to $700 for one of those, but you can't buy just any tuner. You have to get one that's compatible with the digital cable or satellite service you're using. You might even decide to switch services from, say, cable to satellite if you find out that the space-based system beams down more high-def channels and programming. The Voom satellite system, for instance, offers nearly 40 channels of HD programming, far more than other satellite and cable systems. Which begs the obvious programming question: How much high-def is there?

WHAT'S ON

HDTV hardware has only now, six years after it was first introduced, become a consumer must-have. In much the same way, the television production and broadcast industry has been slow to switch even a portion of its programming over to HD. The major networks and public television have led the way and now run several prime-time shows and sporting events in high-def. The pace of change is sure to quicken as consumers vote for HD with their remote controls. Stations that have little or no HD simply will lose eyeballs. DVD fans also will enjoy a quality boost now that two distinct approaches to creating high-def DVDs are in development by competing manufacturers.

The other good news is that HDTV sets make lower resolution analog programming look even better than it already does. As John Revie, then marketing director for Sony's home products division, said recently, "HDTVs have their own picture enhancement circuitry that takes the average analog program and increases resolution and picture performance to near-HD quality." Then there's the audio upgrade. Instead of traditional two-channel stereo sound, you can experience movie theater sound quality from a six-channel digital system.

The latest units let you enjoy current technology and set you up for even more benefits to come. "It seems to me," Revie added, "that if you're in the market for a new TV and are willing to spend money for a premium product, you'll want to keep the future in focus. If you plan to use your set for up to 10 years, keep in mind that future TV content will be HD content. Surely you won't want to miss out." H

Mervyn Kaufman writes from his home in New York City.

FROM TOP: PHILIPS; SHARP; FUJITSU

HDTV Shopping Guide

Tube/30 to 36 inches 	$1,200 to $1,800	Sets with cathode-ray tubes have matured since TV's infancy. Today they offer some of the best viewing quality for the money.	The screen size is limited. Like their analog predecessors, tube sets are heavy and bulky.
LCD/13 to 45 inches 	$1,000 to $7,500	Thin and light, these flat-screen units can be wall-mounted or placed on desks or tables. They're good for video gamers; the image won't burn into the screen.	They have slightly less contrast than a tube TV, and the images may fade slightly if you're not sitting directly opposite the center of the screen.
Plasma/32 to 63 inches 	$2,100 to $25,000	Wall-mount sets are no more than six inches thick, and a very large screen size is possible. Images are bright, and viewing angles are wider than top-quality direct-view TVs.	The sets are weighty and costly to install if hung on the wall. They use a lot of power and generate great heat. Images may not equal those visible on other configurations.
LCD and DLP Rear Projection/42 to 82 inches 	$2,150 to $21,000	These sets are lighter and slimmer than tube sets, with better image clarity. They cost much less than LCD and plasma sets of similar size.	They cost more than tube sets, and they can't be wall-hung like LCD and plasma screens.

to what you see in most movie theaters. This shape shows you movies the way they were filmed, and you can also fully enjoy other telecasts or DVDs set up for letterbox viewing. More sports programming, for example, is being shot and delivered in HD. Besides a wider screen that lets you see more of the action, HD also delivers clarity and color accuracy far superior to what analog technology offers. It's all about pixels.

Pixels? If magnified many times, TV images would appear as a grid of dots—the pixels—which on a standard set would number about 640 horizontally and 480 vertically. HDTV gets its finer resolution by packing in more pixels, 1,920 horizontally and 1,080 vertically. David Ranada, technical editor of *Sound & Vision* magazine, cautions that the heightened clarity can be a mixed blessing, as details lost on analog monitors now show up big time in high-def: the creases on a suit or gown, the wrinkles on the face of a newscaster or the makeup that attempts to hide them.

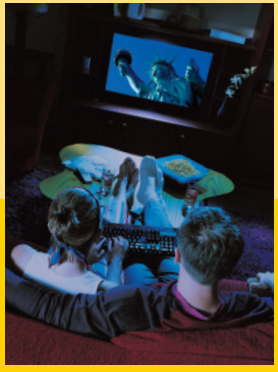
SCREEN PLAYS

When you go to the TV store, the HD revolution will clearly announce itself from long displays of 16:9 sets. They'll be playing the best possible programming—a movie or a show broadcast in high-def—so you'll see all the technology in its full glory. The range of sets plays out this way: Traditional cathode-ray tubes (CRT) have been reshaped to the 16:9 format and set up for high-def's high pixel counts. LCD (liquid crystal display) sets and the generally larger plasma units are versions of the new, thin, wall-mountable screens. Lower on the price scale—but not necessarily on the performance chart—are two new rear-projection technologies. One is LCD-based and the other uses a DLP (digital light processing) chip that incorporates thousands of micro-mirrors. In addition to their excellent picture quality, the depth of LCD and DLP rear-projection TVs has slimmed down considerably compared to their predecessors. A 50-inch screen, for instance,

FROM TOP: PHILIPS; SHARP; FUJITSU; SONY

APPENDIX B

HDTV



A CONSUMER'S GUIDE TO THE WONDERFUL WORLD OF HDTV

CEA
Consumer Electronics Association
www.CE.org/hdtv

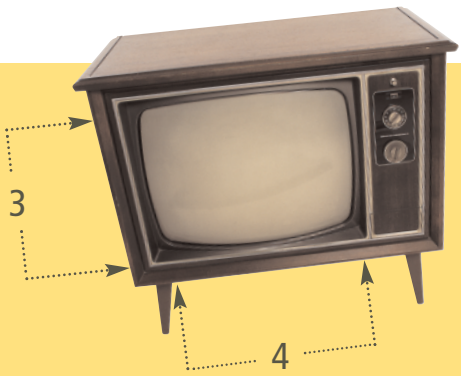
why you want HDTV

HDTV

HIGH-DEFINITION TELEVISION

EXPERIENCE TELEVISION LIKE NEVER BEFORE. PICTURES SO SHARP AND CLEAR YOU'LL THINK THEY'RE REAL. SURROUND SOUND THAT PUTS YOU IN THE MIDDLE OF THE ACTION. SIMPLY PUT: THE HDTV EXPERIENCE IS AMAZING.

HIGH–DEFINITION TELEVISION (HDTV) DELIVERS PICTURE AND SOUND QUALITY THAT ARE A QUANTUM LEAP ABOVE YOUR CURRENT TV SET. IT'S JUST LIKE A MOVIE THEATER WAS PLACED IN YOUR LIVING ROOM! EVERY SHOW YOU WATCH—NO MATTER IF IT'S THE LOCAL NEWS OR A CHAMPIONSHIP SPORTS EVENT—TAKES ON A VIVID BRILLIANCE THAT SIMPLY HAS TO BE SEEN TO BE APPRECIATED.



NTSC

The Incredible **Picture...** **The Awesome** Sound!

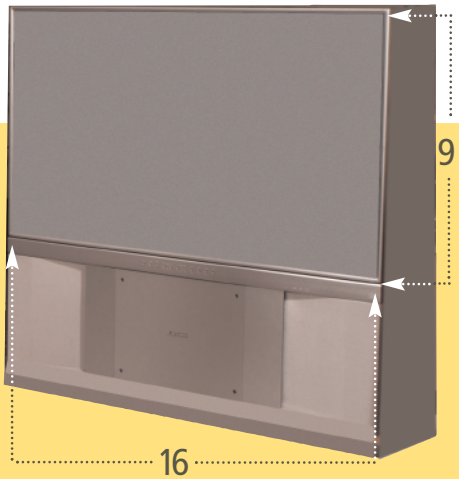
The image seen on the best HDTV set has five times more detail than analog televisions. Now watching a big football game feels like you're 15 rows up on the 50-yard line as you see every inch of the field—even the scuffs on the quarterback's helmet. Not only is the picture more realistic—like looking through a sparkling clean picture window—HDTVs have wider, rectangular screens like movie theaters and deliver the same Dolby Digital surround sound that thrills audiences at the local Cineplex.

HDTV is revolutionizing television as CD players did for music. CDs eliminated scratches and hisses from records, while HDTVs eliminate ghosts, static, snow and poor-quality video. When you see an HDTV program, it's exactly the same as the one that left the TV station: colors are crisp, text is easier to read and the higher quality audio embedded into the signal supercharges the viewing experience.

HDTV is only one part of "digital television (DTV)," an umbrella term covering all of the digital formats for the standard approved by the Federal Communications Commission (FCC) in 1996. The official name is the Advanced Television Systems Committee (ATSC) standard. There are several different DTV picture formats offering varying levels of quality; HDTV with its widescreen picture and Dolby Digital sound is the pinnacle.

Just as there is a wide variety of DTV picture formats, there are different types of digital televisions. The most affordable is capable of showing Standard Definition TV (SDTV). The next best category is Enhanced Definition TV (EDTV), capable of displaying a higher-quality 480 progressive image. An EDTV set has a digital tuner built-in, while an EDTV monitor requires a digital set-top box.

The highest picture quality models are HDTVs (720p, 1080i) with a widescreen 16:9 aspect ratio. This television lets you see uncropped widescreen movies without the black bars on top and bottom used for "letterbox" presentations (letterboxing is the method typically used to "fit" rectangular CinemaScope movies onto a square 4:3 screen). As with all DTV products today (SD, ED), HDTVs are available as HDTV sets with built-in tuners or HDTV monitors that require a digital receiver.

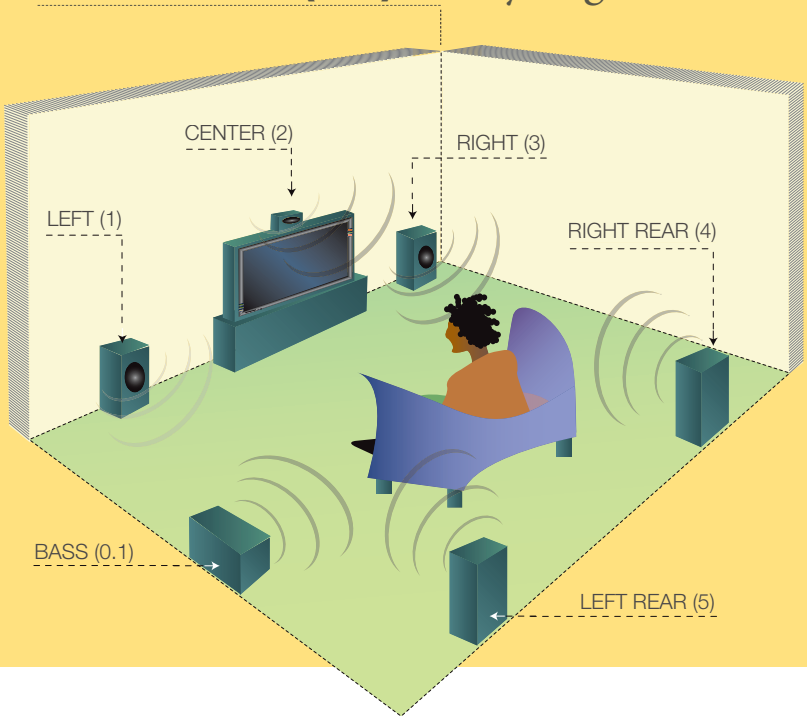


HDTV

BETTER PICTURE
BETTER SOUND
DIGITAL

digital sound

Six Channel (5.1) Dolby Digital Sound



How HDTV Differs from Analog TV

HDTV has higher resolution meaning sharper, clearer pictures: The image on a television is composed of small picture elements called pixels. The pixels in HDTV are closely packed together to provide a highly detailed picture. Current analog TVs display an image of 200,000 pixels. The minimum DTV signal shows 300,000 pixels and hits a maximum of two million for HDTV, the best of the 18 ATSC formats.

HDTV has a widescreen format: In addition to providing improved picture quality with more visible detail, HDTV is transmitted in a widescreen display commonly referred to as a 16:9 format, meaning that the picture is 16 units wide by 9 units high. A conventional analog display is 4 units wide by 3 units high, or 4:3. Thus the 16:9 display provides a wider image area that more closely matches the movie theater experience.

HDTV has better sound: Many HDTV programs also contain six-channel (5.1) Dolby Digital surround sound to provide an immersive audio experience to complement the improved picture quality on HDTV. This is particularly beneficial within a home theater system.

The DTV Standard

On December 24, 1996, the U.S. FCC adopted the major elements of the ATSC DTV standard, mandating its use for digital terrestrial television broadcasts in the U.S. Within the DTV standard are 18 different picture formats. The FCC did not mandate use of the specific HDTV and SDTV formats contained in the ATSC standard, but these have been uniformly adopted on a voluntary basis by broadcasters and receiver manufacturers. All digital receivers (set-top boxes) and HDTV sets receive them all. A DTV receiver, which looks like a VCR or a cable or satellite receiver, gathers and translates the digital signal for the DTV monitor.

In 1997 the FCC adopted companion DTV rules, assigning an additional 6 MHz channel to approximately 1,600 full-power broadcasters in the U.S. to permit them to offer digital terrestrial broadcasts in parallel with their existing analog services during a transition period, while consumers made the conversion to digital receivers or set-top boxes. In accordance with the FCC plan, digital television service was launched in the U.S. November 1, 1998.

The two most commonly used signals by local broadcast stations are EDTV and HDTV. With the current analog system, TV images are created by interlace scanning, which uses two fields of alternating horizontal scanning lines to form a full picture. This picture is referred to as "480 interlace," or 480i. With many DTVs, the number of scanning lines are more than doubled to 1,080 (1080i). This is HDTV and delivers a more detailed image that practically jumps off the TV screen.

HDTV also may be broadcast and displayed as a "progressive image" (720p), like a computer monitor. Here, a full frame fills the screen from top to bottom, eliminating lines altogether so the picture has a more film-like feel. EDTV quality is referred to as 480p for its 480 progressive lines of resolution.

In the new digital era, broadcasters can offer free, over-the-air television of higher resolution and better picture quality than is possible under the current system. If broadcasters so choose, they can deliver HDTV with theater-quality pictures and CD-quality sound. Or a broadcaster can offer several different TV programs at the same time (called "multicasting"), but in a lower resolution – SDTV. Even with fewer than 480 lines of resolution, the picture and sound quality of SDTV still is better than analog TV. The target date for completion of the analog-to-DTV transition is 2006, or 85 percent household penetration, whichever occurs later.

A bounty of beautiful shows

Broadcasters are offering an ever-increasing array of high-definition programming. . . you will be knocked out when you see them. When you get your new HDTV home, you'll have an amazing palette of digital entertainment from which to choose—right in your living room. No matter if you love soap operas, prime-time favorites from network TV and premium cable networks, Hollywood blockbusters or almost every sport you can imagine, you'll likely find sparkling HDTV versions available today.

To find out what programs are airing in HDTV in your town, check out Titan TV (www.titantv.com), a free online program guide from Decisionmark in conjunction with CEA. The National Association of Broadcasters' (NAB) website also is a good source for the latest list of DTV broadcast stations in your area (http://www.nab.org).

Your new HDTV also is a great companion for the many affordable progressive scan output DVD players widely available on the market. While these players don't provide a high-definition image, connect one to your HDTV and you'll see a beautiful, seamless picture that exceeds even the quality of a standard DVD player.

With thousands of DVD titles available and all the new DTV programming on-air, there's no shortage of digital entertainment for your new HDTV.

What is HDTV
and why is it so important?

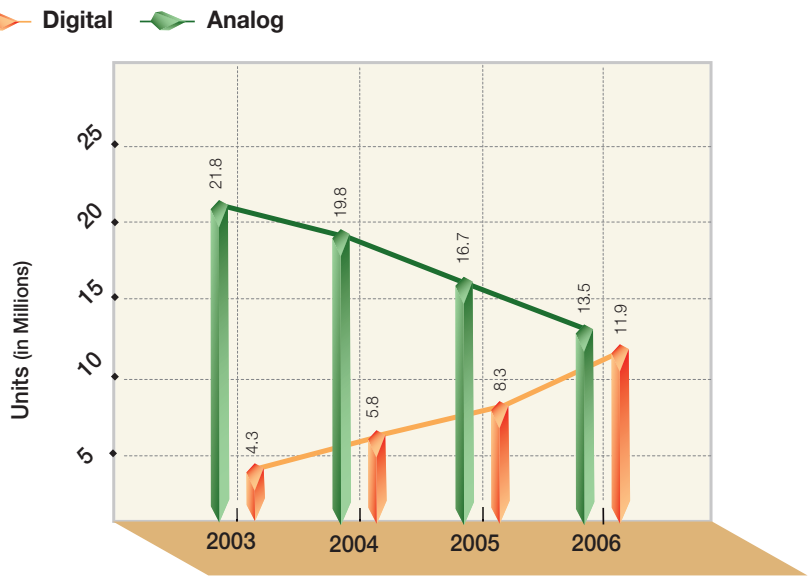
HDTV is an entirely new system that will ultimately replace today's existing analog "NTSC" television system. The term "HDTV" refers to a television system that can transmit, receive and display high-quality digital images.

Once the DTV standard was set in 1996, the Federal government subsequently mandated a nationwide transition for the nation's 1,600-plus television stations to move from analog to digital transmission. In order to facilitate this, the FCC allocated an additional channel to all broadcast TV stations. This second channel is dedicated for digital broadcasts and upon completion of the transition (the year 2006 or 85 percent household penetration, whichever occurs later), the original analog channel must be returned to the government. The FCC will eventually auction the analog channel spectrum.

The World of Television *Goes Digital*

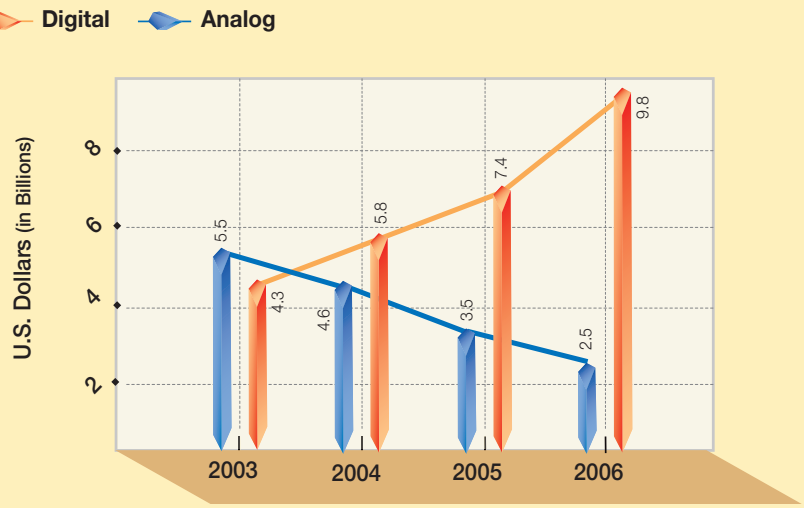
Analog vs. Digital Sales Projections
2003 – 2006

UNITS



HDTV's great picture, the increasing amount of programming combined with the falling prices of HDTVs, is providing consumers with a great incentive to go digital.

U.S. DOLLARS



CEA
Consumer Electronics Association

What makes HDTV better *than today's television?*

HDTV offers incredibly detailed, life-like picture quality with up to five times the sharpness of today's television along with digital surround sound capability and a widescreen format.

Is my current TV *obsolete?*

No, analog televisions will continue to receive analog broadcasts at least through 2006, and probably longer. After that, consumers will be able to connect an inexpensive receiver to their existing TV to decode TV broadcast signals, just not in high-definition. Of course, current televisions will continue to work with cable, satellite, VCRs, DVD players, camcorders, video game consoles and other devices for many years.

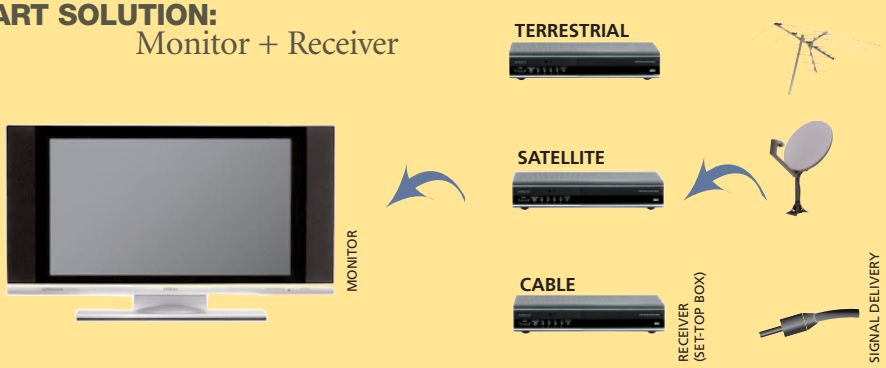
What can *I watch in HDTV?*

The great news for consumers is that Hollywood is creating more and more digital programming at the highest levels of resolution and sound quality.

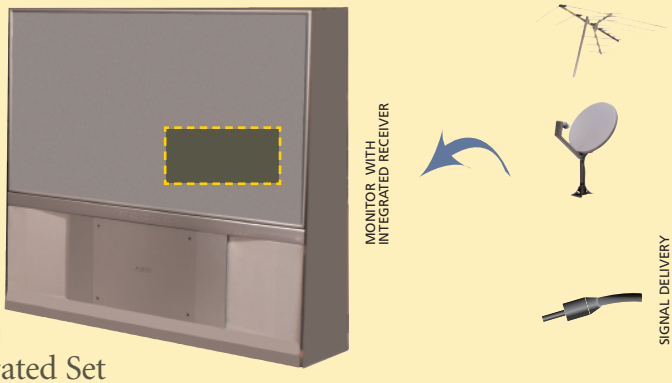
What is the difference between *"digital cable," "digital satellite" and "HDTV?"*

Just because a program arrives through a digital cable or digital satellite doesn't mean it is in high-definition. Much of today's programming – even that received from a digital satellite, digital cable or even a digital channel broadcast over-the-air – is delivered in SDTV. You'll get a better picture than you get with the analog broadcasts TV has used for years, because a digital picture will be free from the "ghosts" and "snow" that can plague analog transmissions. At a minimum, over-the-air SDTV offers a picture 640 pixels wide by 480 pixels high, totaling 307,200 pixels – about 50 percent more than today's analog TV. A standard definition picture will be good, but not nearly as sharp and crisp as high-definition, which can go up to two million pixels.

2-PART SOLUTION:
Monitor + Receiver



how to receive **HDTV**



1-PART SOLUTION:
Integrated Set

How Do *I Receive HDTV?*

There are several components required to watch a program in HD. Generally, it's simple and just like receiving traditional TV:

- The program must be transmitted in high-definition. Viewers can receive HDTV signals through one of three ways: over-the-air broadcast, cable, or direct broadcast satellite.
- At the consumer's home, the signal must first go from the antenna, dish, or cable through a receiver. Again, HDTV Sets have receivers built in (often referred to as "integrated sets"); others require a separate set-top receiver. Cable and satellite subscribers currently need a special HDTV set-top box.
- The program must be viewed on an HDTV Set or Monitor. In addition to a receiver (integrated or via a set-top box), a consumer needs a standalone monitor or integrated set capable of displaying high-definition images.

How do I *know what to buy?*

Start by doing your homework just as you would for any long-lasting household purchase. This primer is a good start. CEA also collects HDTV retailer listings and posts this information on its website – www.ce.org/hdtvguide. These retailer listings are part of a larger print and online resource titled the "HDTV Guide."

Additionally, CEA is working with other industries involved in the transition to promote HDTV and properly educate retail sales personnel so that once you set foot in a consumer electronics store, you'll be guided to the best HDTV purchase for your needs. One partnership CEA has established with Decisionmark is the Titan TV Retail Zone. This program lets retailers enter the address of their customers and quickly determine which local, off-air TV stations are broadcasting in digital, and which programs are available in HDTV. The RetailZone even helps retailers recommend the optimal antenna required to receive DTV at consumers' homes by incorporating CEA's off-air antenna color coding scheme (http://www.antennaweb.org).

Digital TV *Shopping Guide*

Before you walk into a consumer electronics store, it's important to know some key phrases that describe the advanced TV you'll be buying. The good news? There are hundreds of HDTV products available today, and prices are more affordable than ever.

Digital *Television*

Television Type	Resolution	Aspect Ratio	Audio	Rating
High Definition Television	Vertical Resolution from 720p to 1080i	Widescreen (16:9)	Receives and reproduces and/or outputs Dolby Digital 5.1	Best
Enhanced Definition Television	Minimum vertical resolution of 480p	Widescreen (16:9) or traditional (4:3)	Receives and reproduces and/or outputs Dolby Digital 5.1	Better
Standard Definition Television	Less than 480p	Widescreen (16:9) or traditional (4:3)	Receives and reproduces and/or outputs useable audio	Good

Over-the-Air *Broadcast*

At this stage in the analog-to-HDTV transition, consumers need the right equipment for their specific programming wishes and the area in which they live. Currently, the predominant way to watch your local stations' HDTV channel is with an over-the-air antenna. Most cable and satellite providers do not yet carry your local digital channels (check with your cable or satellite provider). This is changing every day as more cable companies join the HDTV bandwagon. Until then, over-the-air HDTV reception is a free and spectacular viewing experience!

If you want over-the-air reception, you will need an antenna. The type of antenna required – rooftop or indoors – depends on your location, the distance from the station's transmitters and the local terrain. In many instances a rooftop antenna will be more effective, but you might have a set of old rabbit ears that work just fine. It varies from household to household. To find out what antenna works for your home, use the CEA antenna selector map program located at www.antennaweb.org. This easy-to-use online tool lets you enter your zip code to see a map plotting your home's proximity to the various HDTV stations in your area. The site also tells you whether you will need a multi-directional or a uni-directional antenna. Again, CEA also has created a color-coded labeling system on antennas to further aide consumers when they shop.

Satellite

To receive HDTV via satellite, you will need a specific receiver, as well as a special satellite dish. Both are readily available from local electronics retailers. DIRECTV and Dish Network are actively promoting their HDTV services. See your dealer or their websites for more details.

Cable

The consumer electronics and cable industries have agreed upon a national standard for HDTV over cable systems that will allow consumers to buy DTVs that connect to digital cable without a set-top box and enjoy easy access to HDTV services offered by cable operators. This "plug-and-play" agreement ensures that "Digital Cable Ready" TVs (DCRs) soon will be available at your local consumer electronics retail store and will allow the millions of cable households in the country to seemlessly transition to HDTV by simply plugging their new DCR HDTV into their cable jack and turning on the set. HDTV service and programming may vary from region to region, so call your cable provider to inquire about HDTV service in your particular area.

HDTV
HIGH-DEFINITION TELEVISION

The best television sets currently available are HDTVs with 16:9 widescreen aspect ratios capable of displaying either 720p, 1080i or higher resolutions. HDTV sets also have built-in digital receivers/decoders and deliver Dolby Digital sound. HDTV sets are available as either direct view (familiar tube TVs), rear or front projection models.

HIGH-DEFINITION TELEVISION HDTV MONITOR

There are also HDTV monitors that offer the same high picture and sound quality as HDTV sets, but require separate receiver boxes to decode digital signals. HDTV monitors are available in either direct view, rear or front projection versions.

HIGH-DEFINITION TELEVISION HDTV TUNER

HDTV tuners are the key to the exciting new digital kingdom. You must have one – either inside or connected as a set-top box – in order to see DTV programs. HDTV tuners decode all ATSC formats and send 480p, 720p or 1080i signals to an HDTV monitor. It also outputs Dolby Digital audio. They are often called set-top boxes, receivers or digital decoders.

EDTV
ENHANCED DEFINITION TELEVISION

Like the highest quality HDTV, Enhanced Definition Television (EDTV) is an all-in-one unit—a display with a built-in decoder in either direct view or rear projection design. In this case, you'll see at least a 480p image, rather than 720p or 1080i. The screen can either be square-shaped (4:3 aspect ratio) or widescreen (16:9). It receives, reproduces and outputs Dolby Digital sound.

ENHANCED DEFINITION TELEVISION EDTV MONITOR

An EDTV monitor has the same display parameters as an EDTV, but does not have a built-in decoder. Occasionally, this type of TV is referred to as a multimedia monitor.

ENHANCED DEFINITION TELEVISION EDTV TUNER

The Enhanced Definition TV tuner receives all digital signals, but outputs them to a TV at 480p resolution, rather than 720p or 1080i.

SDTV
STANDARD DEFINITION TELEVISION

Standard Definition TV (SDTV) sets deliver a digital picture that's better than your current analog TV, but less than the 480p of EDTVs. It has a built-in decoder, but no aspect ratio is specified by CEA.

STANDARD DEFINITION TELEVISION SDTV TUNER

The Standard Definition TV tuner is the one most owners of current analog TVs are expected to purchase in the years ahead. This tuner receives all digital formats and outputs an analog (NTSC) signal. However, it does handle Dolby Digital audio.

The Changing Shape of Television

New digital display technology (DDT) is enabling engineers to create widescreen TVs, flat TVs, wall TVs and, eventually, televisions that you can fold up like newspapers. Here is a layman's look at the basic terms that explain how digital display technology works:

Direct View TVs consist of a picture tube called a cathode ray tube (CRT) and range in screen size from less than a foot (measured diagonally) up to about 40". These sets typically rest on a TV stand or tabletop.

Projection TVs are available in two basic configurations – front and rear projection.

The most popular are one-piece, self-contained rear projection systems with screen sizes ranging from 40-inches to 80-inches. In rear projection TVs the images are reflected by mirrors inside the set onto the screen. Many rear-projection models come complete with built-in surround sound, multi-channel audio systems that create a home theater experience in one unit.

Alternative, two-piece projection systems employ either front- or rear-firing projectors that can sit on small tables or are permanently mounted on ceilings to cast projected video images on separate video screens. These systems produce pictures of 100-inches and larger.

HDTV sets are available today in many shapes, sizes and price ranges and all are designed to fit a certain consumer need.

Currently, most TV projectors – front and rear – use a combination of three CRTs that project images in the red, green and blue color spectrum. It produces large full-color pictures when the three separate images converge on the screen. But new alternatives now further reduce size, eliminate problems related to the misalignment of the CRTs and produce brighter and sharper images. Liquid crystal on silicon (LCOS), digital light amplification (DLA) and digital light processing (DLP) are examples of these newer display technologies.

Digital Light Processing (DLP) uses a digital micromirror device to modulate reflected light. An optical semiconductor chip also adds brightness and clarity to a large screen picture. On opening day in 1998, the Texas Rangers baseball team used DLP technology to display an HDTV picture of the game on an 18-foot diagonal screen.

Liquid Crystal on Silicon (LCOS) technology manages ultra-bright light to deliver high-contrast, sharply focused color images. Utilizing one or three reflective light imagers and a sophisticated prism and lensing system, light is transformed into a laser-like beam and imprinted with a high-definition image that is then magnified and displayed in a perfectly aligned widescreen format.

Digital Light Amplification (DLA) is an electronic valve technology that uses liquid crystal on silicon to enable manufacturers to create a brighter picture on a larger screen.

Flat Panel TVs can be hung on the wall like a picture. "Flat panel" and "flat screen" often are used interchangeably, but these are two distinct terms. A flat screen TV is not necessarily a flat panel TV. Many CRT displays have a flat screen rather than the traditional curved glass screen, but they are not flat panel and therefore, cannot be hung on the wall. Plasma and liquid crystal displays (LCD) are both flat panel display technologies.

Plasma Display Technology does not require a tube and enables manufacturers to create a larger flat-panel TV, up to 60-inches. A plasma display consists of pixels — gas in the plasma state reacts with phosphors in each sub-pixel to produce what engineers call "colored light." That explains how a plasma TV can display such a clear picture with the lights on.

Liquid Crystal Display (LCD) technology now is used on everything from digital clocks to microwaves.These thinner displays require less power than CRTs found in most televisions. Many TV makers are using LCDs to create ultra-thin sets that can display HDTV pictures.

CONSUMER BENEFITS OF NEW DISPLAY TECHNOLOGIES:

New digital display technology (DDT) can dramatically improve the clarity and brightness of the picture, particularly in a well-lit room. It will no longer be necessary to turn out the lights to view your favorite movie. DDT sets also provide distortion-free images at the corners and edges of the screen. A DDT set with HDTV will deliver the best picture available on the market. Additionally, the slimness of a flat panel TV will give consumers more options in organizing the home. Few can look at a flat-panel TV without saying, "Wow."

Compatibility of Cable TV and DTV

"Plug-and-Play"

New Rules Make DTV Transition Easier

The FCC has adopted rules reached between the cable and consumer electronics industries that will help smooth the transition to DTV for millions of Americans. These "plug-and-play" rules will ensure that most cable systems are compatible with DTV receivers and related consumer electronics equipment. This is crucial toward building products, developing services and maintaining a market-friendly environment for HDTV.

The cable plug-and-play rules are important to the DTV transition because they will facilitate the direct connection of digital navigation devices or customer premises equipment, such as television receivers, set-top boxes, and digital recorders that are purchased from retail outlets to cable television systems.

Plug-and-Play DTV

A "plug-and-play" DTV is a television that you can plug directly into your cable system and receive analog and most digital cable services without the need for a set-top box. The cable and consumer electronics industries have dubbed these types of televisions **"digital cable ready"** or **DCR.** More and more cable services are being provided in digital format, and broadcast stations are in the midst of the transition from analog to an all-digital service. Currently, plug-and-play is available for most analog services over cable, but not for digital.

Benefits of Plug-and-Play

- Many consumers like the convenience (and cost savings) of receiving cable programming without the need of a set-top box. If nothing else, it's one less remote control to keep track of!
- You will be able to take your plug-and-play set virtually anywhere in the country and know it will work on cable systems offering digital services.
- Plug-and-play will allow you to fully utilize the features and functions provided by the television set that often are disabled when connected to a cable set-top box.
- Manufacturers will also be able to make other kinds of innovative new plug-and-play products, such as Digital Cable Ready hard-drive recorders, DVD recorders and personal computers. These products will be able to receive digital cable without the need for a set-top box provided by the cable operator.

"CableCARD™"

Digital plug-and-play will not work quite like analog. For digital plug-and-play, you'll probably need to get a security card (also known as a "CableCARD™") from your local cable operator. The security card will permit you to watch scrambled programming and premium services, to which you're subscribed.

FAQ

Will I Need A Set-Top Box If I Have A Plug-and-Play Set?

The first generation of plug-and-play sets will be able to receive one-way programming only, including analog basic, digital basic, and digital premium cable programming. If you want to receive certain advanced digital cable services like video-on-demand, the cable operator-enhanced program guide, or interactive data-enhanced television service, using a first generation set, you will need to use a set-top box. You may also need a set-top box to receive other cable operator-provided services.

Negotiations are underway between the cable and consumer electronics industries to establish standards that would permit plug-and-play sets to provide advanced two-way services as well.

Availability of Plug-and-Play Sets

Plug-and-play sets built pursuant to the new standards may be available as early as the second half of 2004. To know if you are buying a plug-and-play set, ask your retailer if the set is "digital cable ready." Manufacturers that use that label must meet certain technical standards and complete a testing and verification process.

Negotiations are underway between the cable and consumer electronics industries to establish standards that would permit plug-and-play sets to provide advanced two-way services as well.

Watching HDTV On A Plug-And-Play Set

Plug-and-play will permit you to watch digital programming, but as with all DTV sets, only HDTV plug-and-play sets will display full high-definition quality. To be sure, check with your retailer on whether the set displays full high-definition quality or a lower resolution. You should also ask your local cable provider if they offer HDTV programming.

**See also the Federal Communications Commission fact sheet on plug-and-play at www.fcc.gov.*

additional HDTV resources

FEDERAL COMMUNICATIONS COMMISSION (FCC) – The FCC, under the leadership of Chairman Michael Powell, has taken a strong and active role in the HDTV transition. Although its website deals primarily with policy rules and regulations, it also has Consumer Alerts and Fact Sheets. (www.fcc.gov)

ADVANCED TELEVISION SYSTEMS COMMITTEE (ATSC) – The Advanced Television Systems Committee is an international, non-profit organization developing voluntary standards for digital television. The ATSC member organizations represent the broadcast, broadcast equipment, motion picture, consumer electronics, computer, cable, satellite and semiconductor industries. (www.atsc.org)

NATIONAL ASSOCIATION OF BROADCASTERS (NAB) – The National Association of Broadcasters is a full-service trade association that promotes and protects free, over-the-air local radio and television stations' interests in Washington and around the world. (www.nab.org)

NATIONAL CABLE AND TELECOMMUNICATIONS ASSOCIATION (NCTA) – The National Cable and Telecommunications Association, formerly the National Cable Television Association, is the principal trade association of the cable television industry in the United States. (www.ncta.com)

SATELLITE BROADCASTING COMMUNICATIONS ASSOCIATION (SBCA) – The SBCA is the national trade organization representing all segments of the satellite consumer services industry. (www.sbca.org)

A SPECIAL CEA WEBSITE – has a wealth of information on the analog-to-digital television transition. Most of this information is stored on the HDTV Web page, but additional resources, such as policy filings, press releases and publications, may be found through the CE.org search engine. (www.ce.org/hdtv)

HDTV GUIDE – Intended as a resource tool for the industry, the *HDTV Guide* also contains useful information for consumers, such as a detailed listing of HDTV products available with manufacturers' suggested retail prices.

HDTV UPDATE E-NEWS – CEA produces this e-mail newsletter at least once a quarter in order to highlight the latest developments in HDTV programming, policy and related issues. The E-News archive is available online at www.ce.org/hdtv.

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Consumer Electronics Association

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APPENDIX C

HDTV

HIGH-DEFINITION TELEVISION

DIGITAL AND HIGH-DEFINITION TELEVISION

Digital TV (DTV) is an entirely new television broadcasting system that will ultimately replace today's analog system.

High-definition TV (HDTV) is the best quality DTV.

HDTV's sound and picture quality is five times better than today's analog TV.

DTV also can be standard definition (SDTV) [good] or enhanced definition (EDTV) [better].

What you need to watch DTV or HDTV:

DTV (including HDTV) today is available over-the-air using a standard antenna or via digital cable or satellite. However you receive your TV signal, you will need DTV equipment to decode and view the SD, ED or HD quality DTV programming.

DTV equipment today may be purchased as a one- or two-part solution.

Integrated sets are a one-part solution – a digital tuner and monitor all in one, just as TVs always have been. The two-part solution consists of a DTV monitor paired with a DTV receiver/set-top box/tuner.

To watch true HDTV, you must have a program originating in HDTV, an HDTV transmission, an HDTV tuner (receiver) and an HDTV monitor (display). Again, the receiver and monitor may come as a one- or two-part solution.

For digital cable customers, the one-part solution is called a "Digital Cable Ready" set, or DCR, and may be identified by this logo

DCR

Analog TVs (today's TVs) are not obsolete.

All of the broadcast TV stations in the country have been loaned a second, separate channel to use for digital broadcasts. Until 85 percent of the nation's households are capable of receiving DTV programming (households with a DTV receiver), the broadcasters' analog channels will remain in use.

The target deadline for the analog-to-DTV transition is December 31, 2006, but reaching 85 percent likely will take longer. When the transition is complete, analog TVs will need an inexpensive converter box to decode the DTV programming for display on the analog set.

DEFINITIONS

Digital TV (DTV): Television delivered and displayed using computer code (digital technology).

Analog TV: Today's TV system using magnetic waves to transmit and display pictures and sound.

Digital Cable Ready (DCR): A "plug-and-play" DTV for digital cable customers that plugs directly into the cable jack and does not require a separate set-top box.

CableCARD: A security card digital cable customers must obtain in order to view high-definition scrambled programming and premium services.

High-Definition Television (HDTV): The best digital television, widescreen (16 x 9) display with at least 720 progressive (p) scanning lines or 1080 interlaced (i) lines and Dolby digital surround sound.

Standard Definition TV (SDTV): Basic digital television transmission that may be displayed with fewer than 480p lines in 16 x 9 or 4 x 3 format.

Enhanced Definition TV (EDTV): Better digital television transmission with at least 480p, in a 16 x 9 or 4 x 3 display and Dolby digital surround sound.

4 X 3: Traditional TV "aspect ratio," that is, the screen's width as compared to its height.

16 X 9: "Widescreen" TV screen format that is closer to a movie screen than traditional TV.

Interlace Scan: A way to scan vertical lines onto a TV picture by scanning all the odd lines first, then filling in the even lines (this happens in the blink of an eye).

Progressive Scan: A way to scan vertical lines onto a TV picture by scanning all the lines consecutively (progressively).

"HDTV Ready" TV: Term used by some advertising to indicate an analog TV with the display capability and inputs to be transformed into an HDTV with the addition of an HTDV tuner.

HDTV Monitor: Any monitor (display) with the inputs and capability to become an HDTV with the addition of an HDTV tuner.

Integrated HDTV: An HDTV that has the tuner built into the set. It does not need a separate set-top box.

HDTV Tuner (also decoder, receiver, set-top box): A standalone device capable of receiving and outputting HDTV signals.

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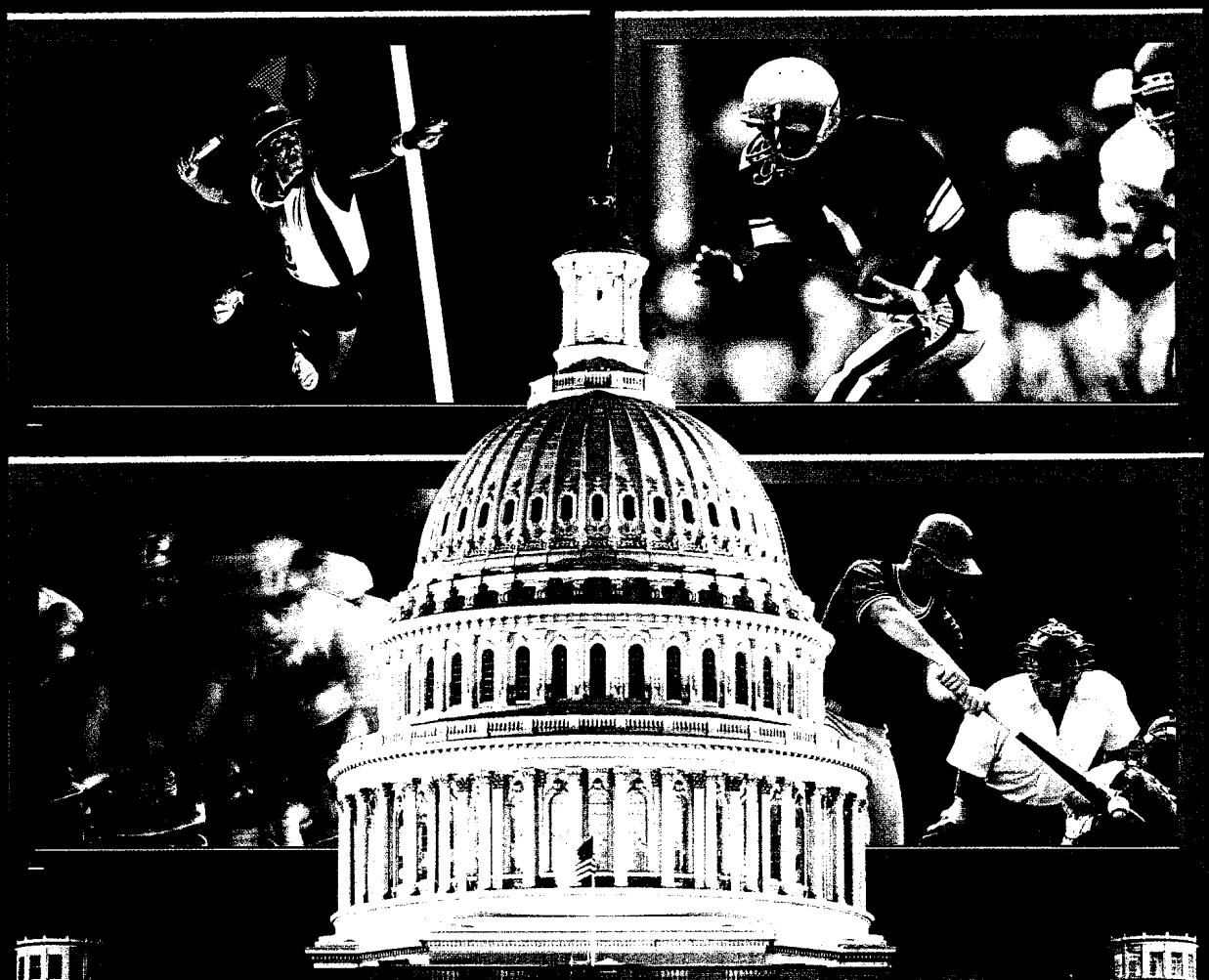
APPENDIX D

HDTV Promotions

THE *HDTV* TRANSITION

Washington Insider Series:
The HDTV Transition



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HDTV: Clarity beyond Compare

2003 saw high-definition television (HDTV) blossom. Sales soared beyond expectations as digital TV (DTV)broadcasts multiplied across the country.

In fact, the HDTV evolution is looking more and more like a real revolution. The evidence? Continued strong unit sales of digital television displays, the continuing resolution of key public policy issues, aggressive new HDTV adoption plans by the cable television industry and a steady increase in the hours of compelling HDTV content.

In 2004, DTV will continue to be the lead growth category in the video industry, a projection supported by the following recent developments:

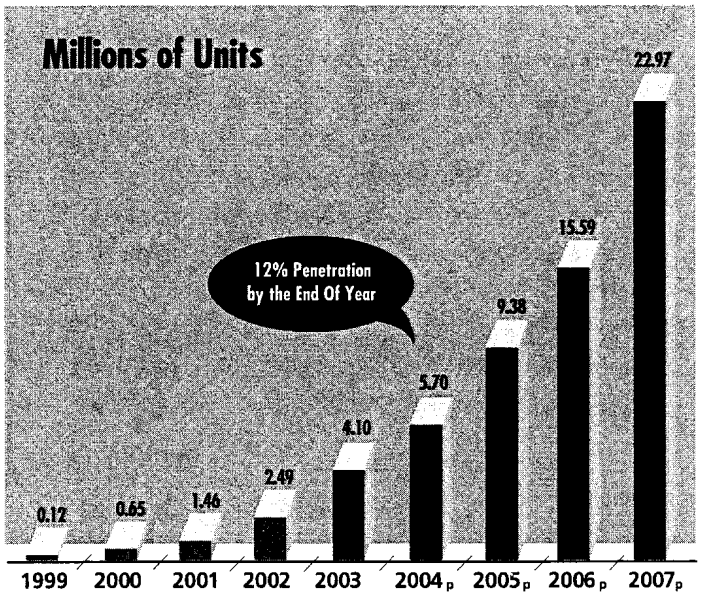
- HDTV sets and monitors now represent the majority of sales of all televisions with screen sizes measuring 40-inches and larger.
- The dollar volume of DTV sets and monitors now regularly surpass that of analog products.
- Sales of HDTV products spread from audio/video specialty retailers and regional/national consumer electronics chains into warehouse clubs and mass merchant discount stores including retail giant Wal-Mart.
- HDTV ranked number six on CEA's annual holiday gift buying survey.

DTV Unit Sales Projections	
5.7 million	2004
9.4 million	2005
15.6 million	2006
23 million	2007

Source: CEA Market Research

Note: DTV products are defined as integrated sets and monitors displaying active vertical scanning lines of at least 480p and, in the case of integrated sets, receiving and decoding ATSC terrestrial digital transmissions.

DTV Factory Shipments



Rising Sales

By the end of 2003, consumers invested just under $20 billion in DTV products with sales for the year having reached 4.1 million units on dollar sales of $5.8 billion. In 2003, consumer enthusiasm for HDTV was so strong CEA upwardly revised its DTV sales projections from 4 million to 4.3 million. CEA also projects that 5.7 million DTV units will be sold in 2004, 9.4 million in 2005, 15.6 million in 2006 and 23 million in 2007. Approximately 85 percent of those sales will go toward HDTV products.

HDTV programming also is on the upswing with more and more digital programs widely available. More than 700 hours of cable HDTV programming now exists combined with the increased hours and program offerings from satellite and over-the-air broadcasts.

Even as sales of sets, displays and set-top decoders soar, demand for high-definition (HD) is creating an abundance of innovative products. Digital cable-ready (DCR) HDTVs, HDTV camcorders, HDTV digital video recorders (DVRs) and the latest display technologies all are available today.

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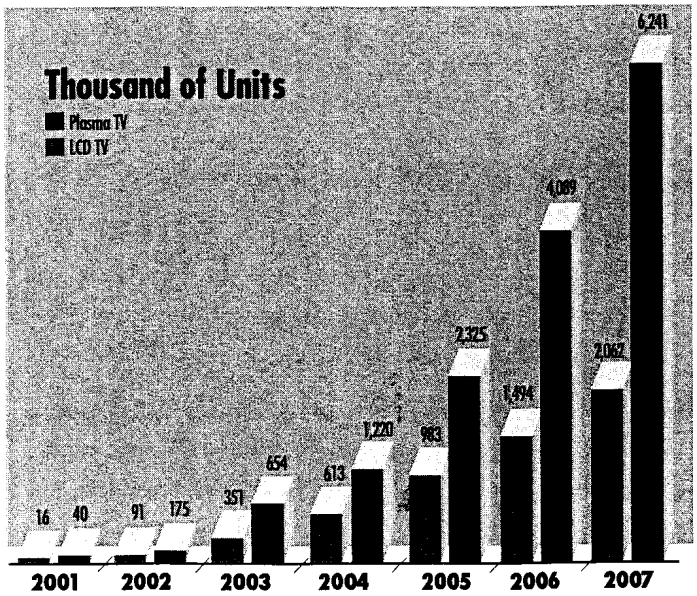
2 Policy Advances

Among the most celebrated HDTV landmarks in 2003 was, of course, the adoption on September 10 of the historic digital cable/consumer electronics "plug-and-play" agreement by the Federal Communications Commission (FCC). This agreement permits DTV manufacturers to produce digital cable ready (DCR) HDTVs for sale at retail. The plug-and-play agreement allows the 70 million analog households who receive their primary television signal via cable to transition seamlessly to HDTV. They will be able to take an HDTV set home, plug it into the cable jack in their wall and turn it on to view glorious high-definition programming. This is big news for cable consumers nationwide who now can easily purchase and enjoy a new DCR HDTV.

Meanwhile, the FCC determined that the broadcast flag, designed to prevent the mass redistribution of digital broadcast television programming over the Internet, would go into effect on July 1, 2005. Products will have to comply with the broadcast flag requirements on that date. In this ruling, the FCC took into account the product development and manufacturing cycles of DTV product manufacturers by extending the compliance deadline as CEA had advocated.

Digital Flat Panel Display Shipments



Source: CEA Market Research, 2004

CEA Supports Fair Use in the Digital Age Boucher/Doolittle Bill Protects Consumers

CEA supports the legislation introduced in October 2002 by U.S. Representatives Rick Boucher (D-VA) and John T. Doolittle (R-CA). The legislation adds fair use protections to U.S. copyright law and the Digital Millennium Copyright Act (DMCA) of 1998, and imposes tough labeling requirements on "copy-protected" CDs. The legislation provides a solid approach to protecting intellectual property rights without jeopardizing consumer fair use of digital media.

CEA President and CEO Gary Shapiro praised the bill's stringent compact disc labeling provisions and said the approach ensures that the play button does not become the pay button as digital technologies proliferate. He said, "This bill adds critical fair use protections to U.S. copyright law. Everywhere we look, Americans' fair use rights and the Supreme Court's Betamax holding are under attack. Representatives Boucher and Doolittle recognize that as we move into the digital age, the public needs these protections to be strengthened not weakened. This bill also protects consumers by making sure they are not fooled into buying 'copy protected' compact disks that will not play in cars, computers or DVD players."

CEA looks forward to participating in additional inter-industry discussions regarding the delicate balance of consumer home recording rights with artists' rights.

Wonders to Come

It has only been five years since digital television first debuted at the 1998 International CES. Today millions of HDTV products are in American homes. Even as we celebrate the successes, bumps remain on the road to widespread adoption of HDTV. In the following pages, we summarize and analyze the latest consumer research, sales trends and outstanding policy issues. Look to CEA throughout the year to obtain the latest on the HDTV transition. At CEA, we remain committed to working through the remaining issues and helping consumers realize the wonders of HDTV. We invite you to join us so we can together fulfill the HD promise.

The Digital Television Transition: Well On Its Way

HDTV rapidly is moving into American homes via over-the-air broadcasting, cable TV, satellite and various "packaged media" formats, such as pre-recorded high-definition (HD) VCRs and new HD digital video recorders (DVR).

More than 1,155 U.S. TV stations in 203 communities now transmit digital TV signals to their local viewers. Today, all of the major broadcast networks offer digital program feeds.

Significantly, about 9 million U.S. households to date have bought digital TV products. Twelve million homes will have purchased DTV equipment by the end of this year, and the number will grow to about 36 million households by the end of 2006. By that time, nearly one-third of American homes will be equipped to watch the dramatic images of DTV.

Despite this progress, several critical hurdles remain. Congress and the FCC must move to assure that the DTV momentum continues. Key policy issues include:

- The need for broadcasters to increase the quantity and the quality of their HDTV programs, including delivery at full transmission power rather than the low-power levels that about two-thirds of stations now offer (low power transmissions limit the reach and viewership of the DTV signals).
- The need for cable operators to retransmit HDTV programs offered by local broadcast TV stations.
- The need to maintain an equitable balance between the legitimate rights of copyright holders and consumers' "fair use" ability to record HDTV shows.

Digital Television (DTV)– A term that encompasses the transmission of TV signals and the receivers used to view programs. DTV technology, which uses computer-like coding, is the successor to and replacement for the 80-year-old analog TV format.

Consumers Eager for HDTV

Americans now can choose from hundreds of models of HDTV products – integrated sets, monitors, HD DVRs and more – available from dozens of manufacturers, using a variety of technologies such as plasma, liquid crystal display, digital light processor (DLP) and liquid crystal on silicon. About one-third of the HDTV monitors are built in the popular "flat panel" format. Newer flat panel models also include a DTV tuner and hundreds of HDTV set "direct view" models use familiar cathode ray tube technology.

Exciting new technologies, developed by American firms and through alliances with global technology leaders, are coming to market to enhance the value of HDTV displays.

The Big Impacters
Digital Cable/DTV Plug-and-Play Agreement
Tuner Mandate
Increasingly Consumer Friendly Prices
Increasing Content

As it stands today, the retail price of HDTV monitors and equipment is dropping at the rate of about two percent per month. DTV products are now available for under $1,000. Overall, the price of integrated HDTV sets, monitors and set-top boxes (receivers) have plummeted by 20 percent in just over a year.

Even at admittedly steep early adopter prices, retail dealers have been unable to stock sufficient supplies of HDTV equipment based on consumer demand. As global manufacturers step up their manufacturing capacities, and as new technologies drive prices downward, the demand will grow rapidly.

High-Definition Television (HDTV) – TV signals with greater detail and fidelity, delivering twice the visual resolution of current TV images plus CD-quality audio. HDTV pictures are displayed in wide screen format (usually a 16:9 ratio).

Consumer shopping patterns show they prefer choices in their HDTV selections, including models with or without built-in

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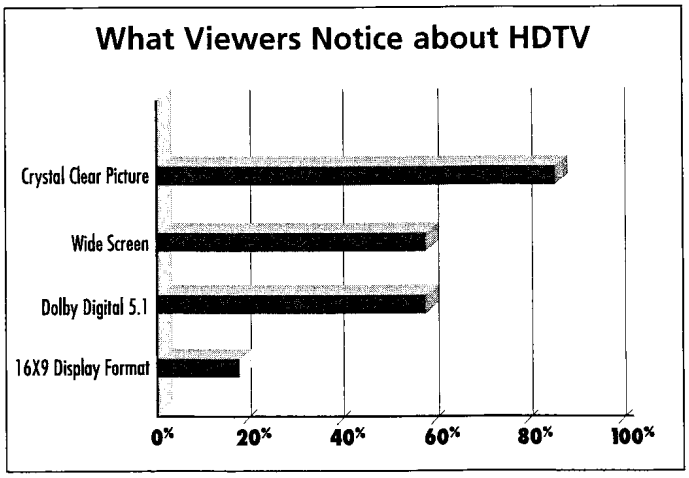
4 broadcast tuners and devices that are compatible with other digital entertainment products.

Congress and the FCC should continue to encourage this marketplace to embrace HDTV and digital television technology.

- *It is counter-productive to force manufacturers to install features or functions that consumers do not want.*
- *It is essential that consumers understand that their existing home devices will continue to work during and after the digital transition.*
- *Consumers must be able to enjoy the full benefits of products they have already purchased.*



Source: CEA Market Research, 2003

For more than two decades, industry and government groups have been preparing for HDTV and subsequently the DTV transition. This includes the establishment of the ATSC (Advanced Television Systems Committee) technical standard for terrestrial broadcasting. TV, cable TV, satellite, computer and consumer electronics companies and their industry associations have collaborated on a vast array of technical and engineering agreements, frequently resolving diverse viewpoints.

CEA Works with Government and Industry

CEA continues to work with government and related industries to educate consumers and resolve remaining policy issues.

- Educational programs: On its own and in collaboration with other DTV stakeholders, CEA has created events and materials to alleviate marketplace confusion about the DTV transition. (See page 7.)
- Spectrum policy: CEA recognizes the importance of returning analog spectrum to the Federal government for reallocation as quickly as possible. With this in mind, CEA programs are intended to help consumers understand the value of DTV services.

Spectrum Policy – Once the broadcasters vacate the analog TV spectrum and focus entirely on their new digital bandwidth, the analog TV spectrum will be returned to the Federal government. The government has already auctioned some of those airwaves for commercial purposes. The return and transfer of this spectrum will result in billions of dollars of new revenue, as well as new innovative products and services, such as the wireless delivery of multimedia content on mobile devices.

Who's Involved In the DTV Transition?

Broadcasters

As a general rule, broadcasters have been slow to embrace digital television. While they are providing an increasing amount of HD programming, most viewers are unhappy with the type and amount of programming according to CEA surveys. Additionally, many of the broadcast stations on the air with a digital signal are transmitting at less than full power, limiting the reach of their signal. Broadcasters respond to these criticisms by pointing to what they claim to be a slow rate of consumer purchases of DTV tuners and the opportunity for piracy (unauthorized access) of HDTV content.

- Consumer electronics companies have assuaged these concerns by pumping millions of reception devices into the marketplace, including integrated DTV sets and component set-top receiver boxes.
- The FCC's Tuner Mandate ruling (upheld in the courts) has assured a continuing flow of DTV reception equipment into American homes as families buy new TV sets.
- The FCC's broadcast flag order prevents the Internet redistribution of broadcast DTV content.

Broadcasters no longer can claim these factors are impediments to DTV and HDTV acceptance.

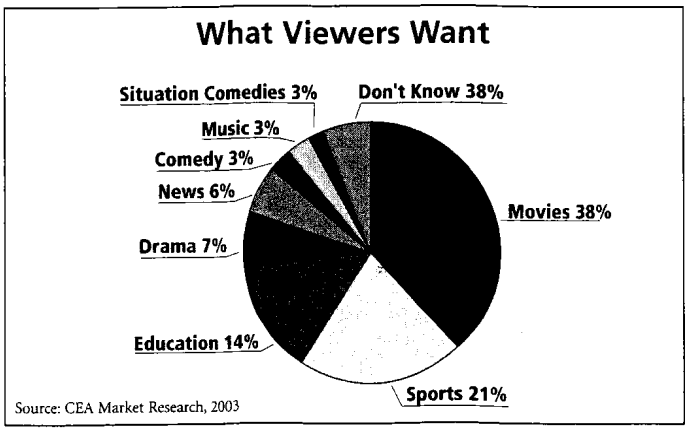
Broadcasters should accelerate their DTV transition. This includes upgrading to full power DTV transmission, aggressively promoting their DTV channels on their legacy analog channels and introducing compelling HDTV programs. (Note: Approximately two-thirds of DTV over-the-air channels currently operate at less than fully authorized power, meaning that large swaths of viewers cannot receive their DTV signals.)

ATSC – Advanced Television Systems Committee is an organization founded in 1983 to research and develop a digital TV standard for the U.S. It developed the ATSC format, which has been adopted by the FCC, for U.S. terrestrial broadcasting. Japan, Korea and other countries have also adopted this format for domestic broadcasting.

Content Providers

"Content is King" remains the mantra for consumer acceptance. Viewers want to see programs they like in HDTV, and when such shows become available, consumers tend to buy more reception equipment.

Nonetheless, broadcasters continue to offer limited HDTV content. When they do carry HDTV programs, networks tend to concentrate on situation comedies and other fare. A CEA consumer survey in October 2003 identified that consumers were unhappy with the available HDTV programming. In particular, consumers asked for more sports and movies.



- More HDTV programs on over-the-air TV are essential for the DTV transition to accelerate.
- Broadcasters must respond to requests from policymakers and consumers for more HDTV shows in 2004.

Cable Television

Nearly 70 percent of U.S. households rely on cable TV for their primary television signal.

For that reason, cable multiple service operators (MSOs) must fully embrace the DTV transition – including retransmission of HDTV signals from local broadcast stations.

Many cable program networks including Home Box Office (HBO), Showtime, Discovery and ESPN have launched HDTV services. Collectively, these and other channels show more than 700 hours per week of HDTV programming.

TV manufacturers and MSOs worked together for more than a year to forge the "plug-and-play" agreement for cable-ready HDTV sets. Simple to connect and use, DCR HDTV sets are attractive for consumers. Several large TV set makers, including Sony, Panasonic and Thomson (RCA) have rushed DCR sets to market this year.

Despite these positive developments, cable MSOs are limiting their carriage of HDTV programs. Specifically, cable operators claim that their must carry requirements do not force them to retransmit both the analog and DTV signals for local broadcasters. That means broadcast HDTV, when it exists, may not be available to the majority of local viewers who rely on cable TV for all their signals.

As broadcasters increase their HDTV programming, cable MSOs must in turn carry that programming over their systems to the 70 million households that depend on cable for HDTV.

- *CEA encourages policymakers to call for as much programming over cable as possible now that consumers will have plug-and-play sets in their homes.*

Digital Cable – Cable TV systems are converting from analog to digital TV technology, enabling them to offer more channels of specialized programs, as well as HDTV and other enhanced services.

Plug-and-Play Agreement

DTV manufacturers and cable MSO representatives have been negotiating for more than five years, under FCC direction, to develop an industry-wide agreement that will allow viewers to obtain digital cable signals through commercially available TV receivers. In December 2002, the industry negotiators unveiled a plug-and-play format that provides for such standarization for one-way uni-directional connectivity. Among other factors, the agreement provides for home recorders to be directly attached to digital cable systems, and adopts "encoding rules" to protect consumers' reasonable and customary recording practices. The FCC adopted this plan in September 2003. The inter-industry negotiators are now working on a "bi-directional" plug-and-play agreement to cover advanced two-way, interactive services.

Satellite TV

Direct-to-home satellite companies (also called Direct Broadcasting Satellite or DBS) – DirecTV, EchoStar and VOOM – have been all digital since their inception. All of them carry HDTV channels as part of their program line-up. Collectively these DBS companies reach nearly 20 percent of U.S. homes, supplementing the multichannel reach of cable operators in both urban and rural communities.

As DBS companies add local broadcast TV channels within specific markets, they may elect to carry the primary analog stations – but not the digital channels from those broadcasters.

DBS carriers should be required to carry the same local digital broadcast channels as cable companies.

Intellectual Property

In addition to HDTV, the digital TV era has created an array of new consumer services and devices. New options abound for home recording of programs, under the "fair use" doctrine for personal entertainment. Countless products are available, such as digital video recorders and set-top boxes with digital recording features.

Twenty years ago, the U.S. Supreme Court protected non-commercial home recording and fair use rights in its historic Betamax decision. By a 5-4 vote the Justices ruled in Sony v. Universal Studios that it was not illegal for Sony to sell its Betamax videocassette recorder to consumers, reversing a 1981 Federal Appeals Court ruling and making consumers the real victor in this landmark case.

Subsequently, Americans embraced VCRs. Today nearly 90 percent of households own and use such devices.

CEA continues to support pro-competitive solutions that preserve consumers' non-commercial home recording rights, protect copyrights and continue to foster innovation and new technologies.

The digital era has brought new challenges to consumers' recording rights. In Congress, statehouses and the courts, music and movie companies are seeking to limit the ways in which consumers can enjoy their new digital products. These assaults include proposed limitations on HDTV recording.

Various schemes and techniques – including selectable output control (SOC) and downresolution (Downres) – seek to block HDTV content, decrease its quality or reach into a consumers' home to cripple the capability of an electronic device. New rules for encoding cable and satellite TV programs could undermine today's reasonable and customary home recording practices.

The negative impact on consumers would put a chill on the momentum of the DTV transition.

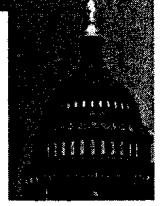
In its plug-and-play decision, the FCC promised to open in 2004 a public comment period regarding the encoding rules contained in the agreement. These rules – agreed upon by the 12 cable MSOs and 14 DTV manufacturers who signed the plug-and-play agreement – achieve the delicate balance between copyright interests and consumer rights.

Selectable Output Controls

As part of the plug-and-play agreement, encoding rules prevent content providers and distributors from turning off consumer home interface devices on a program-by-program basis, which would be highly disruptive to normal consumer expectations. Such SOC practices have been criticized by key Members of Congress.

SOC is the remote signaling of home devices by content providers or distributors, to turn off consumer home interfaces on a program-by-program basis. The interface in question would simply not operate for the particular program. It would mean that a consumer who has purchased an HDTV display, and pays for a set-top box or other device with an HDTV output, still might not receive all of the HDTV programs he or she has paid for — because the interface between the set-top box and the HDTV display has been turned off by the system operator. In the long term, imposition of SOC could have the effect of driving from the market any home interface that supports home recording. CEA has opposed imposition of SOC by law or in any context subject to regulation.

SOC is activated by data "triggers" that ride along with program



information when it is sent to the home. FCC Encoding Rules currently ban SOC use, but the FCC has left the door open to its use in the future.

CEA is adamantly opposed to the use of selectable output control, which is banned in the plug-and-play encoding rules and will be debated during the FCC's public comment period.

In the long term, imposition of SOC could have the effect of eliminating from the market any home interface that supports home recording.

Downresolution

Downres is a procedure that automatically removes half the horizontal and half the vertical "picture elements" (pixels) from and HDTV image, resulting in a picture with only one-quarter the pixels intended for viewing. In other words, consumers are cheated out of the HDTV quality they expect. The Motion Picture Association of America has advocated this process to support HDTV copy protection, especially against home recording or Internet retransmission of copyrighted material. This is intended to discourage marketing of HD-capable recorders with component video inputs.

Since these component video connections are the only HDTV inputs for the four million HD-ready television monitors that have been sold-to-date, this approach would deprive early adopters of full use of their equipment. Application of downres to a signal would mean that a consumer who has purchased an HD-ready display, and pays for a set-top box or other device with an HDTV output would not receive an HD-quality signal for those programs when downres is triggered.

CEA rejects the use of downresolution and seeks to ensure that consumers retain the functionality of the DTV equipment they have purchased.

For more information, visit: www.CE.org/hdtv

CEA Highlights HDTV

The consumer electronics industry remains fully committed to the transition to HDTV. Individual manufacturers are working hard to educate consumers and market HDTV. CEA also has taken a lead role in promoting HDTV to consumers. Our activities include media outreach, public relations and advertising.

- **Educational DVD** – Produced by CEA and the Comcast Media Center, this DVD is distributed to retailers, consumers, the media and others through direct mailings, tradeshows and home expos.
- **The Academy of Digital Television Pioneers** – honors excellence in all aspects of HDTV.
- ***A Consumer's Guide to the Wonderful World of HDTV*** – A primer on HDTV available on www.ce.org/hdtv and through retailers that includes a section dedicated to informing consumers about cable "plug-and-play," including the CableCARD.
- ***HDTV Guide*** – Published three times per year and distributed to consumers, retailers and others interested in the DTV transition across the nation, it includes lists of DTV products currently available in the marketplace.
- **HDTV Summit** – CEA's annual conference explores the issues surrounding the transition and serves as a promotional vehicle for DTV.
- **Home Show Exhibits** – CEA showcases DTV products at five home design shows to attract consumers.
- **Viewing Parties** – CEA sponsors viewing parties for consumers and other key audiences in conjunction with HD broadcasts of major sporting events.
- **HDTV Updates** – CEA brings together local retailers, broadcasters and other interested parties to help market HDTV on the local level.
- **Video and Radio News Releases** – CEA produces and distributes nationally pre-packaged video and radio news releases on DTV.
- **www.CE.org/hdtv** – CEA's informational website promotes HDTV to consumers through CEA media outreach and promotional activities.
- **DTV Working Groups** – These groups of engineers address the standards for various DTV issues, including DTV and digital cable compatibility and other products not already covered by existing definitions.
- **International CES Activities** – CEA leverages the opportunity to promote DTV at the International CES, the world's largest annual technology tradeshow. Specific activities include:
  - Conference sessions
  - HDTV Sports Bar
  - On-site DTV Academy voting for the People's Choice award

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8 HDTV Glossary

4 X3: Traditional TV "aspect ratio," that is, the screen's width as compared to its height.

16 X 9: "Widescreen" TV screen format that is closer to a movie screen than traditional TV.

5.1 Audio Format: A digital audio recording and playback system for home theater. It includes five channels (left, right, center, rear/surround left and right) plus a subwoofer channel. The major 5.1 channel standards are Dolby AC-3 and Philips Musicam.

CableCARD: A security card digital cable customers must obtain in order to view high-definition scrambled programming and premium services.

Digital Cable Ready (DCR): A "plug-and-play" DTV for digital cable customers that plugs directly into the cable jack and does not require a separate set-top box.

Digital TV (DTV): Television delivered and displayed using computer code (digital technology).

Digital Video Recorder (DVR): A consumer device that digitizes broadcast TV onto a hard disk and plays it back immediately, allowing the viewer to pause at any time and return later.

Enhanced Definition Television (EDTV): EDTV refers to a complete product/system with the following minimum performance attributes:

Receiver – Receives ATSC terrestrial digital transmissions and decodes all ATSC table 3 video formats.

Display Scanning Format – Has active vertical scanning lines of 480 progressive (480p) or higher.

Aspect Ratio – None specified

Audio – Receives and reproduces, and/or outputs Dolby Digital audio.

EDTV Monitor: EDTV monitor refers to a monitor or display with the following minimum performance attributes:

Display Scanning Format – Has active vertical scanning lines of 480 progressive (480p) or higher.

Aspect Ratio – None specified.

EDTV Tuner: EDTV tuner refers to a RF receiver with the following minimum performance attributes:

Receiver – Receives ATSC terrestrial digital transmissions and decodes all ATSC table 3 video formats.

Outputs – Outputs the ATSC table 3 720p and 1080 i/p and 480p formats with minimum active vertical scanning lines of 480. Alternatively, the output can be a digital bitstream output capable of transporting 480p, except the ATSC table 3 480i format can be output at 480i.

Audio – Receives and reproduces, and/or outputs Dolby Digital audio.

High-Definition Television: (HDTV): HDTV refers to a complete product/system with the following minimum performance attributes:

Receiver – Receives ATSC terrestrial digital transmissions and decodes all ATSC table 3 video formats.

Display Scanning Format – Has active vertical scanning lines of 720 progressive (720p), 1080 interlaced (1080i) or higher.

Aspect Ratio – Capable of displaying a 16:9 image.

Audio – Receives and reproduces, and/or outputs Dolby Digital audio.

HDTV Monitor: HDTV monitor refers to a monitor or display with the following minimum performance attributes:

Display Scanning Format – Has active vertical scanning lines of 720 progressive (720p), 1080 interlaced (1080i) or higher.

Aspect Ratio – Capable of displaying a 16:9 image. In specifications found on product literature and in owner's manuals, manufacturers are required to disclose the number of vertical scanning lines in the 16:9 viewable area, which must be 540p, 810i or higher to meet the definition of HDTV.

HDTV Tuner: HDTV tuner refers to a RF receiver with the following minimum performance attributes:

Integrated Tuner – An HDTV that has the tuner built into the set. It does nto need a separate set-top box.

Receiver – Receives ATSC terrestrial digital transmissions and decodes all ATSC table 3 video formats.

Outputs – Outputs the ATSC Table 3 720p and 1080i/p formats in the form of HD with minimum active vertical scanning lines of 720p, 1080i or higher. Additionally, it may output HD formats converted to other formats. The lower resolution ATSC Table 3 formats can be output at lower resolution levels. Alternatively, the output can be a digital bitstream with the full resolution of the broadcast signal.

Audio – Receives and reproduces, and/or outputs Dolby Digital audio.

Interlace Scan: A way to scan vertical lines onto a TV picture by scanning all the odd lines first, then filling in the even lines (this happens in the blink of an eye).

Progressive Scan: A way to scan vertical lines onto a TV picture by scanning al the lines consecutively (progressively).

Standard Definition Television (SDTV): SDTV refers to a complete product/system with the following performance attributes:

Receiver – Receives ATSC terrestrial digital transmissions and decodes all ATSC table 3 video formats, and produces a useable picture.

Display Scanning Format – Has active vertical scanning lines less than that of EDTV.

Aspect Ratio – None specified.

Audio – Receives and reproduces useable audio.

SDTV Tuner: SDTV tuner refers to a RF receiver with the following minimum performance attributes:

Receiver – Receives ATSC terrestrial digital transmissions and decodes all ATSC table 3 video formats.

Outputs – Outputs all ATSC table 3 formats in the form of NTSC output.

Audio – Receives and reproduces useable audio. ◆

Continuing the HDTV Transition: CEA's Public Policy Prescriptions

- Broadcasters must transmit at full power.
- Broadcasters must increase promotion of their HDTV content offerings, particularly on their analog channels.
- Cable operators must retransmit broadcast DTV signals in the same format in which they are delivered over-the-air. HDTV programs should be retransmitted in HD, not in a lower-quality format.
- The FCC should finalize the outstanding issues surrounding the historic digital cable/consumer electronics plug-and-play agreement. Specifically, the Commission should:
  - Protect consumers investment in HDTV by denying content providers and distributors the ability to block HDTV content, decrease its quality or reach into a consumers' home to cripple the capability of an electronic device.
  - Preserve home recording rights by rejecting calls to extend and modify elements of the agreement designed to protect home recording rights into a broad mandate to restrict technology not specifically discussed in the proceeding.
  - Ensure that content providers and distributors incorporate the broadcast flag in a manner that does not restrict consumers' customary practices and reasonable expectations regarding the home recording and distribution of digital content.
- The Federal Communications Commission (FCC) should adopt the ATSC PSIP standard, which enables the "handshake" between the broadcast signal and the DTV receiver that enables many of the TV set's functions. Doing so would provide the basis for operation of closed captioning and program ratings functions.

For more information on the HDTV transition, please contact:

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Jeff Joseph, CEA vice president communications and strategic relationships - 703-907-7664/jjoseph@ce.org

Jenny Miller, CEA senior manager, communications and public policy - 703-907-7079/jmiller@ce.org

HDTV PROMOTION AND CONSUMER EDUCATION

HDTV

FOR RELEASE

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Jenny Miller
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CEA LEADS IN HDTV PROMOTION AND CONSUMER EDUCATION

Document Submitted To FCC Outlines Multi-Million Dollar Investment To Reach Millions Of Consumers

Arlington, VA, June 30, 2003 – Showcasing the consumer electronics industry's broad-based programs to promote digital high-definition television (HDTV) and educate consumers about the analog to digital television (DTV) transition, the Consumer Electronics Association (CEA) today submitted to the Federal Communications Commission (FCC) a document outlining past, present and future DTV initiatives. The CEA document supplements information conveyed to the Commission over the past week by individual DTV manufacturers in response to the FCC's latest DTV inquiry.

"We have a strong record of transition leadership on all fronts, but the policy community may not be aware of the full extent of our market-oriented initiatives," said CEA President and CEO Gary Shapiro. "The FCC's request for industries to weigh in on their educational efforts presented CEA an opportunity to showcase all that we're doing for DTV that buttresses the efforts of individual manufacturers. While we weren't required to submit anything with the FCC, we wanted to let policymakers know that CEA has been and remains at the forefront of industry efforts to promote HDTV and alleviate consumer confusion."

Shapiro also pointed out that for DTV to make the final leap to a mass-market product, it must be conveniently accessible by the 70 percent of Americans who receive their primary video signal over cable. "We believe that lack of rapid FCC action on the cable-consumer electronics compatibility agreement submitted to the FCC on December 11 could put the digital television transition at risk," Shapiro explained. "The fact is that most new TVs are purchased for use on cable systems. For many Americans, the ability to easily access digital content over cable will be the most critical aspect of their decision to acquire a DTV. The ability to get a cable compatible product to consumers by mid-2004 will require a final decision on plug-and-play compatibility by August 2003. Lack of FCC approval of the plug-and-play agreement will mean that another model year will unnecessarily pass by without a consumer-friendly DTV solution for American cable viewers."

Shapiro noted that CEA currently is developing point-of-sale educational pieces, including a retailer "tip sheet," which will provide salespeople and consumers with a concise overview of DTV terminology and reception requirements. CEA also is co-producing a retailers guide to selling HDTV that will feature frequently asked questions, selling tips and other key

information. In association, CEA also is developing an online training and certification program for retailers.

"These new initiatives build upon the myriad efforts CEA has undertaken to promote and bring HDTV to market for more than a decade," Shapiro said. "We recently announced the next six markets for our HDTV Update meetings where we bring together local DTV leaders – retailers, broadcasters, programmers and other service providers – to discuss how best to promote DTV in their particular market. CEA already has visited 15 of the top 20 DTV markets as part of this program and continues to communicate with those markets through our monthly electronic newsletter, the *HDTV Update E-News*."

Shapiro also said that CEA will continue several existing programs, such as the CEA media tour and consumer home show appearances. The media tour, which reached nearly 90 million consumers during 2002, raises consumer interest about HDTV and helps drive consumers to retailers to see, hear and learn more about HDTV. Undoubtedly one of CEA's most successful DTV outreach efforts, the media tour hit 75 major media markets in 2002 and CEA representatives appeared on more than 134 TV and 3,194 radio programs, including *CNN Headline News*, *CNBC*, *BBC*, *CNET* and *Webfn First Business*.

CEA's participation at select home and design shows across the country has provided hundreds of thousands of consumers with direct access to a variety of the latest DTV products and question and answer sessions with CEA. Markets are selected based on DTV activity from local retailers, broadcasters, cable and satellite providers. CEA already has participated in a major home show held in Minneapolis, Minnesota in 2003 and plans to continue the home show DTV program in 2004.

"We are succeeding in reaching consumers and will continue to do so," Shapiro concluded. "We proactively have devoted human and monetary resources – roughly $5 million – to promotional and educational efforts and the investment certainly is worth the price. CEA market data indicates electronics industry initiatives to educate consumers about HDTV and the digital transition – like those of CEA and its member companies – have made a significant impact on consumers, many of whom are embracing DTV thanks to increased understanding of the switch from analog to digital. Since introduction to the market in late 1998, DTV product sales now total more than 5.8 million units with a consumer dollar investment of some $10.3 billion."

The full document provided to the FCC may be accessed via www.CE.org/hdtv.

About CEA:

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the consumer technology industry through technology policy, events, research, promotion and the fostering of business and strategic relationships. CEA represents more than 1,000 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $85 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

Turn It On

CEA also sponsors and manages the International CES – Defining Tomorrow's Technology. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

UPCOMING EVENTS

- ◊ **CEA 2003 Summer Technology & Standards Forum**
  August 4-8, 2003, Quebec, Canada
- ◊ **CEA 2003 Fall Conference and Industry Forum**
  October 12-15, 2003, Carlsbad, CA
- ◊ **2003 Fall Electronic House Expo (EHX)**
  November 11-13, 2003, Long Beach, Calif.
- ◊ **2004 International CES – Defining Tomorrow's Technology**
  January 8-11, 2004, Las Vegas, NV

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AN UPDATE ON CEA'S HDTV PROMOTION AND EDUCATION LEADERSHIP

A recently fielded telephone survey conducted by the Consumer Electronics Association's (CEA) Market Research Department focused on HDTV consumer awareness and interest. While the results clearly demonstrated progress, they also revealed that as consumers become more familiar with DTV terminology and see more HDTV programs, they have additional questions and more points of confusion arise. The right information needs to reach consumers and CEA continues to lead the way in this regard.

CEA has produced and released many of the materials referenced in a report earlier this year about education and promotion programs including: 1) an original 14-page consumer brochure titled "A Consumers Guide to the Wonderful World of HDTV," which provides a straightforward description of the analog to digital HDTV transition; 2) an original buck slip style "Retailer Tip Sheet" – a simple two-sided reference sheet designed to fold-up in a sales person's shirt or pants pocket for a quick glance during customer interaction to ensure accurate information about the transition and its technology; 3) four video clips produced by Premier Retail Networks and NBC that describe HDTV and have played in major retail chains this fall (see CEA's Original Report below for element details) and 4) a high-resolution CD-ROM containing a wealth of print and photo resources for consumer reporters to reference and run with articles on the transition.

Additionally, CEA has successfully continued one of the most well received programs – the HDTV Update meetings. Over the past several months, CEA has held HDTV Updates in Denver, CO (September 16); St. Louis, MO (September 17); Orlando, FL (September 30); Cleveland, OH (October 1) and San Diego, CA (October 15). For two years we have worked with 23 of the top 25 DTV broadcast markets to accelerate the transition at the local, as well as national, level. We plan to continue and expand the program in 2004 and will likely revisit our earliest markets to touch base with those DTV parties to gauge their progress and help them reach a successful conclusion.

CEA also promotes HDTV success stories to consumers via the Academy of Digital Television Pioneers Awards program – specifically through The People's Choice Award, which is open to the public for voting. Online voting will begin January 8, 2004 at www.ce.org/dtvacademy and will close February 15. This category allows HDTV owners and even television and entertainment enthusiasts to cast their vote for their favorite program that is broadcast in HDTV.

Finally, CEA President and CEO Gary Shapiro personally invited several DTV retailers to work with CEA on our existing education efforts or in designing new, customized programs together. Specifically, he sent the new print materials and information about a new retail training program under development directly to the CEOs and top executives from prominent DTV retailers: Best Buy, Circuit City, Sears, Good Guys, Tweeter Home Entertainment, Ultimate Electronics and Target Corporation. Shapiro also offered to create a specialized HDTV Update for a retailer's various regions.

CEA is determined to continue leading the way in point-of-sale education and overall HDTV promotion and DTV transition education. In order to achieve maximum results, we need and encourage involvement from all transition leaders.

CEA'S ORIGINAL REPORT – PROMOTING HDTV

CEA commands a proactive consumer education and promotional campaign that communicates the facts about the analog to digital television (DTV) transition and the wonders of DTV technology. CEA also leads a broad communications and public affairs campaign designed to additionally educate the industry, retailers and the media to ensure accurate third party coverage and portrayal of consumers' DTV options.

Building on CEA's six years of DTV promotional efforts, CEA in 2003 is proud to report to the Commission on current and planned efforts to further our leadership position in promoting DTV and educating consumers about the DTV transition.

The Final Stretch of the Transition (2003 -?)

DTV product sales are skyrocketing and more consumers are jumping on the HDTV bandwagon, but CEA remains committed to reaching all Americans with information about the analog to DTV transition. To that end, we have DTV promotional plans active and in place to see us – and American consumers – to 2006 and beyond.

Point-of-Sale Efforts: Earlier this year, CEA and Decisionmark announced a joint program to help retailers answer consumer questions about digital television (DTV) at the point of sale. CEA and Decisionmark are working hand-in-hand to educate and encourage retailers to utilize the TitanTV Retail Zone, a free online resource to aid retailers in educating consumers on their choice for DTV purchases. Specifically, retailers are able to enter the address of their customers and quickly determine which local, off-air TV stations are broadcasting in digital and which programs are available in high-definition (HDTV). The RetailZone can even help the retailer find a recommendation for the optimal antenna to receive DTV at consumers' respective household location by incorporating CEA's off-air antenna color coding scheme (antennaweb.org). CEA's Antennaweb program demonstrates the CE industry's commitment to free over-the-air DTV. This $250,000 antenna mapping program, which CEA created and financed independently when the broadcast community declined a partnership, has been available and promoted to consumers for more than 3 years.

CEA also is working with a Nielsen-measured, in-store television network to write and produce four in-store HDTV consumer education spots of approximately 2 minutes each in length that will run on HDTV displays and sets on the retail show floor. The consumer education spots cover HDTV topics including the history of HDTV, how to receive HDTV programming, DTV product choices (monitor vs. integrated set, as well as display types) and the widescreen format. These spots will run this fall in major consumer electronics retail chains across the country including Wal-mart, Circuit City, Best Buy and Sears, and will result in 170 million gross impressions a month. CEA has plans to work on similar projects in the future.

To further address point-of-sale promotions, CEA independently plans to create a retailer "DTV Tip Sheet" that will be distributed to DTV retailers online and through a partnership with a major retail trade publication. This pocket guide for retail salespeople will provide a quick reference in answering consumer questions on the sales floor. Finally, CEA currently is investigating a co-produced "sales tip" book and consumer DTV primer with a retail trade publication.

Direct-to-Consumer: In addition to the point-of-sale consumer education programs mentioned above, CEA is reaching consumers directly by participating in home and design shows across the country. Displaying the latest DTV products, programming and delivery means allows CEA to showcase DTV in a non-retail setting and directly answer consumer questions. In February 2003, CEA exhibited HDTV at the Minneapolis Home & Garden Show. At this and other home

shows, CEA displays a variety of DTV products and delivery systems available in the market, and CEA spokesman Jim Barry conducts informational DTV seminars. In 2004, CEA will continue and expand the home show presence program.

CEA also hopes to promote DTV products and programming directly to TV viewers by making available to winners of DTV Academy programming awards a banner advertisement for placement on the analog and DTV station program signals. The Academy of Digital Television Pioneers (DTV Academy) consists of a select group of individuals – manufacturers, broadcasters, engineers, policymakers, content creators and more – who have made a significant contribution to the development, success and promotion of DTV. Each year, the DTV Academy honors excellence in all aspects of digital content development and delivery through a variety of award categories.

Educating Consumers Through Other DTV Evangelists: As a national trade association representing consumer electronics manufacturers, it is challenging to reach consumers through third parties, such as retailers, broadcasters and the media, but CEA is doing its utmost through partnerships like Decisionmark and PRN, and also by simply making available informational resources.

The Media - One such resource is the CEA Media Tour Program through which CEA informs consumers and the media about the HDTV transition and promotes the sale of DTV products year-round. Featuring CEA spokespeople Jim Barry and Jack Wayman, the media tour raises consumer interest about HDTV and helps drive consumers to retailers to see, hear and learn more about HDTV. Undoubtedly one of CEA's most successful DTV outreach efforts, the media tour hit 75 major media markets in 2002 and CEA representatives appeared on more than 134 TV and 3,194 radio programs, including *CNN Headline News*, *CNBC*, *BBC*, *CNET* and *Webfn First Business.*

In addition to the national media spokesmen tour, CEA's broadcast news releases, media forums and online services keep DTV in the news and in front of consumers year-round on national and local TV, radio news broadcasts, newspapers and Web media.

Related Industries – Arguably the most successful media campaign could never match those DTV promotional tools that are generated on a market-specific basis and are tailored to the locale. Appreciating that local retailers, broadcasters, manufacturer representatives and cable and satellite providers have the best sense of their individual market's consumers, CEA has spent the past two years pulling together these local DTV leaders in 15 of the top 20 DTV markets and has plans to visit six additional markets before the end of 2003. Through these "HDTV Update" meetings, CEA contributes a valuable national perspective – facts and ideas gained from past experiences and travels across the country – and the local parties have the opportunity to meet one another to share perspectives and information in order to grow DTV in their own market – in their own unique way.

CEA also has created and plans to grow the *HDTV Update E-News*, a monthly electronic newsletter that is distributed to past HDTV Update attendees in order to maintain our relationship and continue to share ideas with these markets. The E-News also is posted online for public access at www.ce.org/hdtv and is routinely distributed at consumer and industry events.

CEA'S PROUD HISTORY – PROMOTING DTV SINCE INTRODUCTION

Since introduction of digital television (DTV) products into the consumer marketplace in 1998, CEA has been a leader in educating multiple audiences about DTV technology and products.

DTV's Marketplace Introduction (1997-1999)

CEA's first promotion for DTV actually began in mid-1997 and continued into 1998. Then named the Consumer Electronics Manufacturers Association (CEMA), CEA created a "Digital TV Retailer Transition Tool Kit" that was distributed to retailers nationwide. This included information such as "What is Digital TV?" and broadcaster rollout schedules. CEA also reached out to 500,000 consumers with promotional pieces bundled in credit card bills explaining digital technology and how "Digital TV" was the newest manifestation of this technology.

Anticipating the launch of the first digital broadcast stations, CEA also conducted a 10-market pre-launch retailer tour with the National Association of Broadcasters (NAB) in the top ~~10~~ markets – San Francisco, CA; Los Angeles, CA; Dallas, TX; Atlanta, GA; Chicago, IL; Detroit, MI; New York, NY; Boston, MA; Philadelphia, PA and Washington, DC. The tour expanded in 1999 to include in-store demos for consumers and made stops in Cincinnati, OH; Raleigh, NC; Houston, TX; Portland, Oregon; Indianapolis, IN and Seattle, WA.

DTV Programming Lends A Hand (2000-2002)

As more stations came on the air with a digital signal, more DTV programming became available for retailers – and CEA – to display for consumers on the hundreds of DTV products already on the market.

Viewing Events & Home Shows

In 2000, CEA held a consumer Super Bowl viewing event in Baltimore, MD with the local ABC affiliate and hosted in-store "Final Four" viewing events in Los Angeles, CA and San Francisco, CA at prominent consumer electronics retailers, Ken Cranes, Circuit City and Good Guys!. Viewing events continued into 2001 thanks to a partnership amongst CBS, Samsung and Sears for HD College Football coverage, which allowed CEA to host viewing parties for consumers in Tampa, FL.

CEA also participated in the New York City and Chicago Design Shows, showcasing DTV products and programming to these active DTV markets and making staff available in the booth to answer consumer questions. Additionally, CEA's media spokesman conducted consumer electronics seminars at each of these events to educate show attendees These initial design show booths were so successful in terms of direct interaction with DTV consumers that CEA expanded this program to include: Atlanta Spring and Fall Home Shows, Chicago Design Show and NBC4's "Digital Edge" Expo in Washington, D.C. (2001); St. Louis, MO Home Show and NBC4's "Digital Edge" Expo in Washington, D.C. (2002) and Minneapolis Home Show (2003).

Print Materials

HDTV Guide - Recognizing the need to routinely catalog DTV products and other transition information, CEA partnered with TWICE Magazine in 1999 to produce the first "DTV Guide – The Resource for Information on the Analog to Digital Transition." Four years later and now titled the *HDTVGuide* to emphasize the best of DTV, this publication includes policy update articles, product charts with suggested retail prices, a list of retailers that carry DTV products and a list of the broadcasters sending DTV signals. In the October 2001 issue we also began listing those markets with cable and satellite carriage of DTV signals. The HDTV Guide is available by mail or online and is distributed at events with a CEA presence.

Informational Flyers – CEA also distributes informational flyers at consumer events, such as the "Seeing is Believing" piece, which outlines what is required to receive and view DTV

programming. Flyers, brochures and consumer-oriented frequently asked questions (FAQ) consistently have been used in direct-to-consumer or retailer communications.

Inter-Industry Relationship-Building

CEA hosts an annual HDTV Summit in Washington, D.C., which brings together DTV transition stakeholders to focus on solutions to pressing DTV issues of the day while recognizing progress made in the transition through the Academy of Digital Television Pioneers Awards. Plans for the 2004 HDTV Summit already are underway.

CEA also provides industry forums, including the DTV Subdivision, to discuss issues related to the DTV transition on a regular basis with broadcasters, carriers and set manufacturers.

CEA partnered with the NAB and launched a Digital TV Zone campaign in the summer of 2001. The Digital TV Zone initiative consisted of DTV set placements and viewing parties throughout the "Zone" cities, as well as local meetings amongst retailers, broadcasters and manufacturers to discuss transition obstacles in their market.

CEA found the most productive component of the Digital TV Zone campaign to be the inter-industry meetings on this local level and thus was born the HDTV Update program, which continues today.

A SECOND QUARTER UPDATE ON CEA'S HDTV PROMOTION AND EDUCATION LEADERSHIP

The Consumer Electronics Association (CEA) is pleased again to provide the Commission with a report on digital television (DTV) outreach. Second quarter 2004 activities continue to demonstrate the entire consumer electronics industry's commitment to sharing the facts about the analog to DTV transition, as well as the benefits of high-definition television (HDTV), with consumers through industry outlets and the media.

CE Know How Retailer Training (www.ceknowhow.com) – CEA's CEknowhow.com program is designed to equip retailers with up-to-date online training for sales associates, so they can more effectively respond to consumer inquires related to DTV and HDTV. The training component for DTV on ceknowhow.com launched March 29, 2004 at the ninth annual HDTV Summit. Since then, more than 4,250 unique users have used the CEknowhow.com training program to better understand information ranging from basic definitions and ATSC standard formats to the equipment required to receive and view HDTV content via antenna, satellite or cable delivery. Flexible enough for any retail environment, the DTV module also is customizable, allowing retailers to license and tailor the program.

Digital Cable Ready (DCR) and CableCARD – CEA is spreading the word about the arrival of Digital Cable Ready (DCR) HDTVs, emphasizing information about accessing a CableCARD through cable providers in order to enjoy premium programming and subscription services. The consumer electronics industry has reported to the cable industry and the media that more than 540,000 Digital Cable Ready HDTVs will be sold by September and that more than one million will be in homes by this holiday season – sales figures that call for ample CableCARDs from the cable industry in order to support these households' transition to DTV.

Consumer Advocacy Group Outreach – In coordination with the Commission, CEA educated consumer advocates by exhibiting DTV and distributing DTV transition literature at the National Association of Consumer Agency Administrators (NACAA) annual meeting, June 27-29. More than 150 influential state and local consumer agency administrators received information for their constituents regarding the analog to DTV transition. They also were able to see and hear the DTV difference by visiting CEA's booth, which demonstrated color analog TV, standard definition TV and high definition TV in a side-by-side comparison exhibit. www.nacaanet.org

Online Consumer and Retailer Tools – In addition to the retailer training courses offered online via www.ceknowhow.com, CEA maintains the consumer-oriented antenna selector site, www.antennaweb.org and soon will release another online consumer resource called the *CEA Connections Guide*. The *Connections Guide* website allows consumers to see and learn how to connect various consumer electronics products, including DTV products, set-top boxes, DVRs, DVDs and more, by walking the visitor through the cables required and where to connect them on each device.

Educational Print and Online Resources – Throughout the second quarter, CEA has continued to make available to reporters and retailers several print and online pieces designed to educate the DTV novice about the transition, technologies and available programming. Chief among these is the consumer brochure titled, "A Consumer's Guide to the Wonderful World of HDTV." All of these materials have been updated to provide information regarding Digital Cable Ready products and CableCARDs.

CEA and DTV equipment manufacturers remain committed to leading the way in providing point-of-sale educational materials and overall HDTV promotion and DTV transition education. In order to achieve maximum results, we need and encourage involvement from all transition leaders.

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HDTV Guide - Recognizing the need to routinely catalog DTV products and other transition information, CEA partnered with TWICE Magazine in 1999 to produce the first "DTV Guide – The Resource for Information on the Analog to Digital Transition." Four years later and now titled the *HDTVGuide* to emphasize the best of DTV, this publication includes policy update articles, product charts with suggested retail prices, a list of retailers that carry DTV products and a list of the broadcasters sending DTV signals. In the October 2001 issue we also began

listing those markets with cable and satellite carriage of DTV signals. The HDTV Guide is available by mail or online and is distributed at events with a CEA presence.

Informational Flyers – CEA also distributes informational flyers at consumer events, such as the "Seeing is Believing" piece, which outlines what is required to receive and view DTV programming. Flyers, brochures and consumer-oriented frequently asked questions (FAQ) consistently have been used in direct-to-consumer or retailer communications.

Inter-Industry Relationship-Building

CEA hosts an annual HDTV Summit in Washington, D.C., which brings together DTV transition stakeholders to focus on solutions to pressing DTV issues of the day while recognizing progress made in the transition through the Academy of Digital Television Pioneers Awards. Plans for the 2004 HDTV Summit already are underway.

CEA also provides industry forums, including the DTV Subdivision, to discuss issues related to the DTV transition on a regular basis with broadcasters, carriers and set manufacturers.

CEA partnered with the NAB and launched a Digital TV Zone campaign in the summer of 2001. The Digital TV Zone initiative consisted of DTV set placements and viewing parties throughout the "Zone" cities, as well as local meetings amongst retailers, broadcasters and manufacturers to discuss transition obstacles in their market.

CEA found the most productive component of the Digital TV Zone campaign to be the inter-industry meetings on this local level and thus was born the HDTV Update program, which continues today.

If you are not able to view the following, please visit http://208.55.128.144/hdtv/july2004.html

CONTACT US

CE.ORG/HDTV

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CEA Industry Forum - Click HERE to Register Today

Be sure to register for CEA's Industry Forum, October 18-20, San Francisco, CA, where we'll discuss the digital television transition in addition to a range of business and policy issues facing the consumer electronics industry. Visit www.ce.org/events for more information and to register online.

May and April 2004 Sales Saw an Increase After Record-Breaking First Quarter

Manufacturer-to-dealer DTV product sales continued to climb in April following an all-time high this past first quarter. With unit sales of 309,098 and dollar revenues of $413 million, April 2004 sales surpassed April 2003 by a 76 percent increase in units and 48 percent in dollars, according to the Consumer Electronics Association (CEA).

May unit sales totaled 296,601 (a 22 percent increase over May 2003) and represented dollar sales of $383,209,959 (an 11 percent increase over May 2003).

In addition, CEA reported sales for the current year-to-date. Through May 2004, unit sales reached 1,581,011 units and dollar revenues equaled $2.24 billion. This represents an 85 percent increase in units and 59 percent increase in dollar sales compared to the year-to-date totals in May 2003.

Cumulative DTV sales (sales since product introduction in 1998) have surpassed the 10 million unit mark totaling 10.5 million units through May 2004. Cumulative dollar sales totaled $17.5 billion.

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CEA Materials for Your Use

Are you making the most of the materials CEA has created for your use? Visit www.ce.org/hdtv to see the consumer brochure that walks the reader through the analog to digital television transition. This brochure and an accompanying DVD are available for you to customize and distribute to your customers. CEA also had a "Retailer Tip Sheet" that fits in a shirt pocket for easy reference during a customer encounter. We designed these pieces with you in mind and we hope you put them to good use. Contact CEA's Jenny Miller for more information at jmiller@ce.org or 703/907-7079.

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Updates on the DTV Transition

CEA Endorses FCC Media Bureau DTV Plan, Offers Modifications

To Help Spur DTV Transition
- Cable Carriage, Support and Promotion of CableCARDS and Full Power Broadcasts are Key to Rapid Transition, Testifies CEA's Shapiro

CEA Urges Senate To Help Secure Consumer Friendly Transition To Digital Television

- Shapiro: "CEA commends the Senate Commerce Committee for its longstanding focus on the DTV transition and supports today's exploration of ways to ensure the quick return of the analog spectrum. As the government continues to monitor and assess the transition, we urge policymakers and regulators to ensure that fundamental consumer rights are preserved and that all Americans get access to the high-definition television (HDTV) experience."

Barton Issues Statement on Digital TV Transition Plan: DTV Transition Top Communications Policy Objective

- "U.S. Rep. Joe Barton, R-Texas, chairman of the House Energy and Commerce Committee, issued the following statement today as part of a hearing entitled, 'Advancing the DTV Transition: An Examination of the FCC Media Bureau Proposal.'"

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HDTV Industry News

2004 Athens Games: Coverage by NBC Universal Networks
- "For the first time by a U.S. broadcaster at a Summer Olympics, NBC will provide high definition coverage. NBC's separate, unique HDTV coverage on NBC's digital affiliates, presented by Sony Electronics Inc., will provide HDTV coverage on delay of six sports from the only main Olympic venues provided in high definition by the Olympic host broadcaster."

Terayon Creates Ground-breaking Opportunities for Advertisers to Target Local Audiences Through High Definition Television Programming

- Powers Industry's First HD Advertising Insertion for Cox Communications

DISH Network Passes 10 Million Customer Milestone

- DISH Network Thanks Customers, Retailers by Giving Away 1,000 Complete High Definition Television Systems

PRN Corporation and CNET Show Consumers How to Choose an HDTV at Top Retailers Nationwide

- HDTV Departments at Best Buy, Circuit City, Sears Now Feature CNET's Expert Guidance in Ongoing Series of One-Minute Videos

HDTV Coming to a Hotel Near You

- "Federal Communications Commission (FCC) regulations requiring virtually all TVs to include digital television (DTV) tuners by 2007 applies not only to consumer sets, but also to TVs installed in hotel rooms. Those DTV tuners, which receive HDTV broadcasts, will be phased- in starting next month with 36-inch and larger TVs."

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News from TWICE Magazine

June 21, 2004:

Digital Cable Ready HDTV Sales To Hit One Million

Philips Rolls Out 'Ambilight,' Cineos HDTV Lines

June 7, 2004:

Samsung Reveals 1,080p DLP, CableCARD Plans

DLP TVs Highlight Toshiba Lineup

Hitachi Unveils CineForm Series Fixed-Pixel TVs

May 17, 2004:

VOOM And O'Rourke Ink Distribution Deal

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HDTV Programming

Visit the AVS Forum for the Latest HDTV Programming Information

HDNet to Provide Live HDTV Coverage of Political Conventions

- Democratic Convention is Monday, July 26 - Thursday, July 29
- Republican Convention is Monday, August 30 - Thursday, September 2

INHD and Major League Baseball Productions Announce the Premiere of "Cathedrals of the Game"

- 15-part series premieres Sunday, July 11, 2004, at 7p.m. ET

INHD Announces June Schedule for the UEFA Euro 2004™ Tournament in Widescreen High Definition

- Airing June through July 2004

HDNet Gains First-Run Cable HD Rights to the WB's "Smallville": HDNet will be the first and only place off-network to see all first-season episodes in HD

- Beginning Fall 2004

Comcast Enhances ON DEMAND and HDTV Lineups with Discovery's Real World Programming

- Beginning late Summer 2004

HDNet to Launch "Up Close With Roy Firestone"

- Series premieres Summer 2004

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HDTV

Turn It On

FOR RELEASE

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e-mail: jjoseph@ce.org **e-mail: jmiller@ce.org**
http://www.CE.org

CEA TO UNVEIL NEW HDTV EDUCATIONAL MATERIALS AT CEDIA-CEA HDTV UPDATE

CONSUMER BROCHURE AND RETAILER "TIP SHEET" TOP LIST OF LATEST HDTV EDUCATION AND PROMOTION EFFORTS

Arlington, Va., September 3, 2003 – Making point-of-sale education about the analog to digital television (DTV) transition a reality for consumers, the Consumer Electronics Association (CEA) today announced two tools for high-definition television (HDTV) retailers to make available on the retail sales floor. The new materials will first be made available at the HDTV Update session in Indianapolis this Friday, which is being co-hosted by the Custom Electronic Design & Installation Association (CEDIA).

The first CEA piece – a consumer-oriented HDTV overview – is titled, "A Consumer's Guide to the Wonderful World of HDTV." The 14-page guide provides the basic facts about the DTV transition and HDTV technology and answers consumers' most frequently asked questions (FAQ). The FAQ covered in the brochure include what signal and equipment is needed to receive HDTV, what will happen to analog TV once the transition is complete and more.

"Despite the best efforts of manufacturers, retailers and others, consumer confusion about HDTV remains high. Our goal is to help reduce that confusion," said CEA President and CEO Gary Shapiro. "These new materials from CEA will help us reach that goal by targeting the messenger closest to the HDTV consumer – the retailer."

CEA plans to distribute the consumer guide to DTV leaders at industry events, HDTV Updates this fall and through direct mailings. Retailers will be encouraged to download and customize the brochure via CEA's website at www.ce.org/hdtv so that HDTV consumers will have access to the information at point-of-sale.

In order to aid the retail sales associate in training and on the sales floor, CEA will make available a retailer "tip sheet," which is designed as a folded, pocketsize buck slip containing quick facts about HDTV. One side of the tip sheet contains a general overview of the analog to DTV transition, while the other contains DTV definitions, such as 16:9, 4:3, progressive and interlace scanning and integrated HDTV set. The retailer tip sheet also will be available for download and customization.

The Consumer Electronics Association (CEA) represents more than 1000 corporate members involved in the design, development, manufacturing and distribution of audio, video, mobile electronics, wireless and landline communications, information technology, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $80 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry. CEA represents the consumer electronics industry in association with the Electronic Industries Alliance (EIA).

CEA also sponsors and manages the International CES – Defining Technology's Future. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

UPCOMING EVENTS

- ◊ **CEA Fall Conference and Industry Forum**
  October 13-16, 2002, San Francisco, CA
- ◊ **Electronic House Expo - Fall**
  November 11-14, 2002, Long Beach, CA
- ◊ **2003 International CES – Defining Technology's Future**
  January 9-12, 2003, Las Vegas, NV
- ◊ **Electronic House Expo - Spring**
  February 26-March 1, 2003, Orlando, FL
- ◊ **CEA 2003 Winter Technology & Standards Forum**
  February 24-February 28, 2003, Scottsdale, AZ
- ◊ **2003 CEA Winter Summit**
  March 4-6, 2003, St. Regis Aspen, Aspen, CO
- ◊ **Asian Home Electronics Fair**
  May 14-17, 2003, Shanghai, China
- ◊ **7th Annual Consumer Electronics CEO Summit**
  June 18-20, 2003, Vail, CO
- ◊ **CEA 2003 Summer Technology & Standards Forum**
  August 1-4, 2003, Location TBA
- ◊ **CEA Industry Forum & Fall Conference**
  September 14-17, 2003, Carlsbad, CA

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HDTV

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http://www.CE.org

HDTV UPDATE MEETINGS TO BE HELD IN SIX NEW MARKETS THIS FALL, SAYS CEA

Top 24 DTV Broadcast Markets Reached Between 2002 and 2003

Arlington, VA, June 9, 2003 – The Consumer Electronics Association's (CEA) popular "HDTV Update" program is being expanded to six additional digital television (DTV) markets this fall. These industry breakfast meetings – already conducted in 15 of the top 20 DTV markets across the country – provide a national perspective of where the analog to DTV transition is heading. Significantly, the unique program brings together local cable operators and broadcasters with retailers and other local DTV leaders to discuss collaboration to achieve greater consumer awareness of the best of DTV – high definition television (HDTV).

The six markets, selected based on a strong retail HDTV presence as well as the breadth of DTV cable operators and broadcasters, are Denver, CO (September 16); St. Louis, MO (September 17); Orlando, FL (September 30); Cleveland, OH (October 1); San Diego, CA (October 15) and Sacramento, CA (October 16).

"Sales of HDTV products, wider availability of HDTV on cable and satellite, and more programming confirms that this transition is moving ahead full steam," said Jim Barry, CEA media spokesperson who leads the HDTV Update presentations. "Nonetheless, there still is a great deal of confusion, especially among consumers. Bringing together these parties at the local level will work towards reducing that confusion and help to keep the momentum building."

The HDTV Update meetings are open to anyone in the retail, broadcast, cable and content or programming industries, involved in the HDTV transition. Anyone interested in attending these programs should contact Bob Loder, Golden Loder Associates, (908) 889-8300 x121, or bloder@goldenloder.com.

About CEA:

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the consumer technology industry through technology policy, events, research, promotion and the fostering of business and strategic relationships. CEA represents more than 1,000 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $85 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

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UPCOMING EVENTS

◊ **Electronic House Expo - Spring**
February 26-March 1, 2003, Orlando, FL

◊ **CEA 2003 Winter Technology & Standards Forum**
February 24-February 28, 2003, Scottsdale, AZ

◊ **2003 CEA Winter Summit**
March 4-6, 2003, St. Regis Aspen, Aspen, CO

◊ **HDTV Summit & the Academy of DTV Pioneers 2002 Awards**
March 10, 2003, Renaissance Hotel, Washington, DC

◊ **CEA 2003 Spring Leadership Retreat**
May 5-6, 2003, Grand Hyatt, Washington, D.C.

◊ **CONNECTIONS™ 2003**
May 7-9, 2003, Fairmont Hotel, San Jose, CA

◊ **Asian Home Electronics Fair**
May 14-17, 2003, Shanghai, China

◊ **7th Annual Consumer Electronics CEO Summit**
June 18-20, 2003, Vail, CO

◊ **CEA 2003 Summer Technology & Standards Forum**
August 4-8, 2003, Quebec, Canada

◊ **CEA 2003 Fall Conference and Industry Forum**
October 12-15, 2003, Carlsbad, CA

◊ **2004 International CES – Defining Technology's Future**
January 8-11, 2004, Las Vegas, NV

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CEA ANNOUNCES SPRING HDTV UPDATE MEETINGS

RETAILERS, BROADCASTERS AND CABLE REPRESENTATIVES TO MEET AND SHARE IDEAS ON TRANSITION TO HDTV

Arlington, VA, January 29, 2003 – The Consumer Electronics Association (CEA) today announced that HDTV Update meetings would be conducted in six markets this spring to bring retailers, broadcasters and cable representatives up to date on the state of the analog to digital television (DTV) transition. The meetings provide a national perspective of where the transition is heading and give local parties an opportunity to discuss ways of working together to achieve greater consumer awareness of the best of DTV – high definition television (HDTV).

The six markets, selected based on a strong retail HDTV presence as well as the breadth of DTV broadcasters, are Dallas (February 25), Atlanta (February 26), Tampa/St. Petersburg (March 25), Miami/Ft. Lauderdale (March 26), Seattle (April 29) and Phoenix (April 30). The morning presentations will be hosted by Jim Barry, CEA media spokesperson, and are free of charge. Topics to be covered include HDTV sales results and projections and market research data compiled by CEA.

"We have received tremendous feedback from attendees at past meetings, particularly regarding bringing the local players together so they can work in cooperation to facilitate this transition," said Gary Shapiro, president and CEO, CEA. "When we complete this next series of meetings we will have convened the movers and shakers of the HDTV transition in 9 of the top 10, and 14 of the top 15 television markets."

In addition to hosting the HDTV Update meetings, CEA also produces the *HDTV Update E-News* newsletter each month to keep parties informed and up-to-date after the face-to-face meeting has occurred.

- more -

HDTV Update Meetings To Be Held In Five New Markets This Fall, Says CEA/2

CEA also sponsors and manages the International CES – Defining Tomorrow's Technology. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

UPCOMING EVENTS

◊ **7th Annual Consumer Electronics CEO Summit**
June 18-20, 2003, Vail, CO

◊ **CEA 2003 Summer Technology & Standards Forum**
August 4-8, 2003, Quebec, Canada

◊ **CEA 2003 Fall Conference and Industry Forum**
October 12-15, 2003, Carlsbad, CA

◊ **2003 Fall Electronic House Expo (EHX)**
November 11-13, 2003, Long Beach, Calif.

◊ **2004 International CES – Defining Tomorrow's Technology**
January 8-11, 2004, Las Vegas, NV

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HDTV

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Jenny Miller
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e-mail: jmiller@ce.org

CEA HOSTS HDTV UPDATES IN KEY MARKETS

RETAILERS, BROADCASTERS AND CABLE REPRESENTATIVES TO MEET AND SHARE IDEAS ON TRANSITION TO HDTV

Arlington, VA, August 28, 2002 – The Consumer Electronics Association (CEA) announced that high definition television (HDTV) update meetings would be conducted in five markets this fall to bring retailers, broadcasters and cable representatives up-to-date on the state of the HDTV transition. The meetings are intended to provide a national perspective of where the transition is heading and give local parties an opportunity to discuss ways of working together to achieve greater consumer awareness of HDTV.

The five markets, selected based on a strong retail HDTV presence as well as the breadth of digital television (DTV) broadcasters, are as follows: Philadelphia (September 18), Washington, D.C. (September 19), Boston (September 24), San Francisco (October 16) and Los Angeles (October 17). The breakfast presentations will be hosted by Jim Barry, CEA media spokesperson, and are free of charge. Topics to be covered include HDTV sales results and projections and market research data compiled by CEA.

"As part of the TV manufacturers' continuing effort to drive the transition, we are bringing together retailers and content delivery people on a local level to help expand HDTV viewership in more homes," said Gary Shapiro, CEA president and CEO. "We had great success with similar meetings in Detroit, Chicago and Minneapolis earlier this year, so it was a logical decision to extend the program into more of our major HDTV markets."

Anyone interested in attending these programs should contact Bob Loder, Golden Loder Associates, (908) 889-8300 x121, or bloder@goldenloder.com.

About CEA:

CEA To Unveil New HDTV Educational Materials At CEDIA-CEA HDTV Update/2

About CEA:

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the consumer technology industry through technology policy, events, research, promotion and the fostering of business and strategic relationships. CEA represents more than 1,000 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $85 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

CEA also sponsors and manages the International CES – Defining Tomorrow's Technology. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

About the CEA DTV Subdivision:

CEA's DTV Subdivision was formed in 2001 to bring together key industries and individuals working to facilitate the United States transition to digital television. The Subdivision stands as a forum for diverse parties to join together to address the remaining roadblocks and strive to finalize the transition. Membership is open to all interested industry parties who have a stake in a swift and successful DTV transition. For more information on becoming a part of this collective force, contact CEA's DTV Subdivision representative, John Tunnell, at (703) 907-7647 or jtunnell@ce.org.

UPCOMING EVENTS

- **2003 CEA Industry Forum**
  October 13-15, 2003, Carlsbad, CA
- **2003 Fall Electronic House Expo (EHX)**
  November 11-13, 2003, Long Beach, CA
- **2004 International CES – Defining Tomorrow's Technology**
  January 8-11, 2003, Las Vegas, NV
- **CEA 2004 Winter Technology & Standards Forum**
  February 22-27, 2003, Ft. Lauderdale, FL
- **2004 Winter Summit**
  February 26-29, 2004, Aspen, CO
- **2004 Spring Electronic House Expo (EHX)**
  March 11-13. 2003, Orlando, FL
- **Connections 2004**
  May 5-7, 2004, Dallas, TX
- **8th Annual Consumer Electronics CEO Summit**
  June 23-26, 2004, Huntington Beach, CA

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AntennaWeb

http://www.antennaweb.org/aw/welcome.aspx

Apple .Mac Amazon eBay Yahoo! News

CEA

AntennaWeb

Home FAQ Links Antenna Info About CEA Contact Us

Welcome to AntennaWeb.org

CEA's antenna mapping program, AntennaWeb.org, will help you determine the proper outdoor* antenna to use in order to receive your local television broadcast channels.

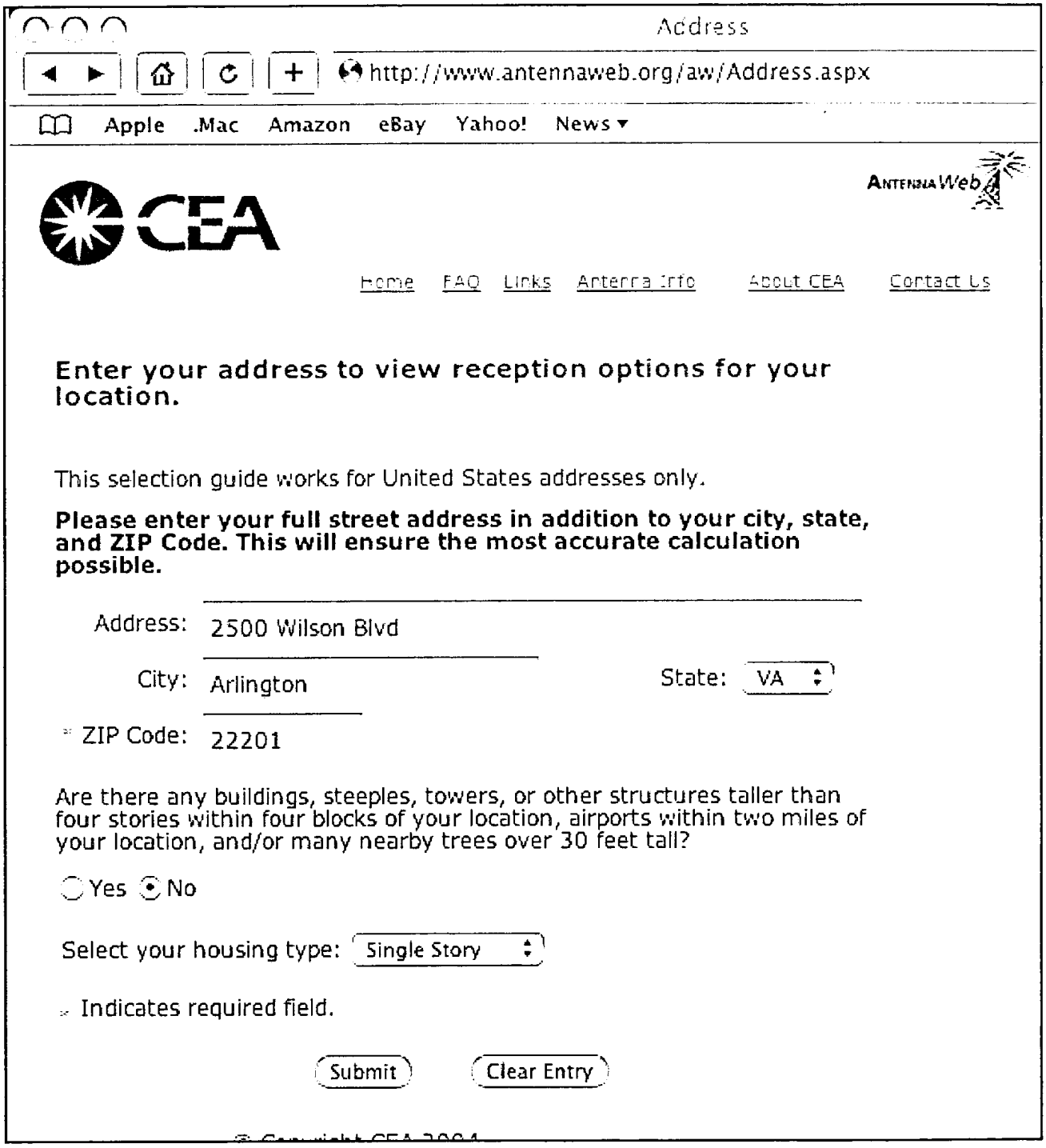
Whether the antenna you want is for use with a home satellite system, high-definition television (HDTV) or a traditional analog set, this site, based on geographical maps and signal strengths, will show you what you need to know to buy the right antenna.

Let's get started!

Choose an antenna

**Indoor antennas are not included in this mapping system because many variables determine the quality of reception in a specific location.*

A Consumer's Guide to the Wonderful World of HDTV


Address
http://www.antennaweb.org/aw/Address.aspx
Apple .Mac Amazon eBay Yahoo! News
CEA
ANTENNAWEB
Home FAQ Links Antenna Info About CEA Contact Us
Enter your address to view reception options for your location.
This selection guide works for United States addresses only.
Please enter your full street address in addition to your city, state, and ZIP Code. This will ensure the most accurate calculation possible.
Address: 2500 Wilson Blvd
City: Arlington
State: VA
* ZIP Code: 22201
Are there any buildings, steeples, towers, or other structures taller than four stories within four blocks of your location, airports within two miles of your location, and/or many nearby trees over 30 feet tall?
Yes No
Select your housing type: Single Story
* Indicates required field.
Submit
Clear Entry

CEA

AntennaWeb

Stations

Address Location Results
The address you entered was located at the **Street** level.

Stations and Antenna Types
TV reception is determined by the size and type of antenna and the direction in which it is pointed. To determine the right antenna, use the color coded Antenna Type to select the channels that you wish to view. Antenna types are color coded according to the size and type of antenna needed for reception. The list is arranged in order of ease of reception, with the stations requiring the smallest multidirectional antenna at the top, to those requiring the largest directional antennas at the bottom.

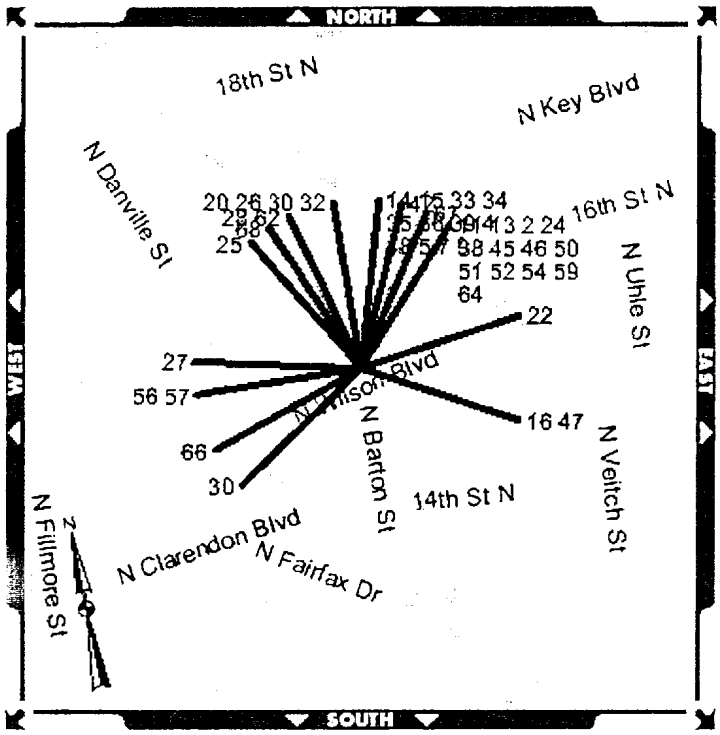
Use the "Compass Orientation" listed below to point your antenna or rotor system for the channels you wish to receive. Please note that "Compass Orientation" is referenced to magnetic North.

View Street Level Map

(•) Show All Stations ( ) Show Digital Stations Only ( ) Show Analog Stations Only

DTV	Antenna Type	Call Sign	Channel	Network	City	State	Live Date	Compass Orientation	Miles From	Frequency Assignment
	red - uhf	WFDC	14	TFA	ARLINGTON	VA		17°	3.5	14
*	red - uhf	WFDC-DT	15	TFA	ARLINGTON	VA	TBD	17°	3.5	15
	red - vhf	WTTG	5	FOX	WASHINGTON	DC		15°	4.5	5
*	red - uhf	WTTG-DT	5.1	FOX	Washington	DC		14°	4.5	36
	red - vhf	WRC	4	NBC	WASHINGTON	DC		17°	3.5	4
*	red - uhf	WRC-DT	4.1	NBC	Washington	DC		17°	3.5	48
	red - uhf	WNUV	54	WB	BALTIMORE	MD		43°	32.6	54
	red - uhf	WNVC	56	IND	FAIRFAX	VA		272°	7.3	56
*	red - uhf	WNVC-DT	57.1	IND	Fairfax	VA		272°	7.3	57
	red - uhf	WZDC-LP	64	TEL	ARLINGTON	VA		44°	6.0	64
	red - vhf	WUSA	9	CBS	WASHINGTON	DC		17°	4.2	9
*	red - uhf	WUSA-DT	9.1	CBS	Washington	DC		17°	4.2	34
*	red - uhf	WJZ-DT	13.1	CBS	Baltimore	MD		48°	38.6	38
	red - uhf	WHUT	32	PBS	WASHINGTON	DC		1°	5.2	32
*	red - uhf	WHUT-DT	33	PBS	Washington	DC	Testing	17°	4.2	33
*	red - uhf	WMAR-DT	2.1	ABC	Baltimore	MD		48°	38.6	52

DisplayMap



ZOOM OUT

ZOOM IN

Printer Friendly Map

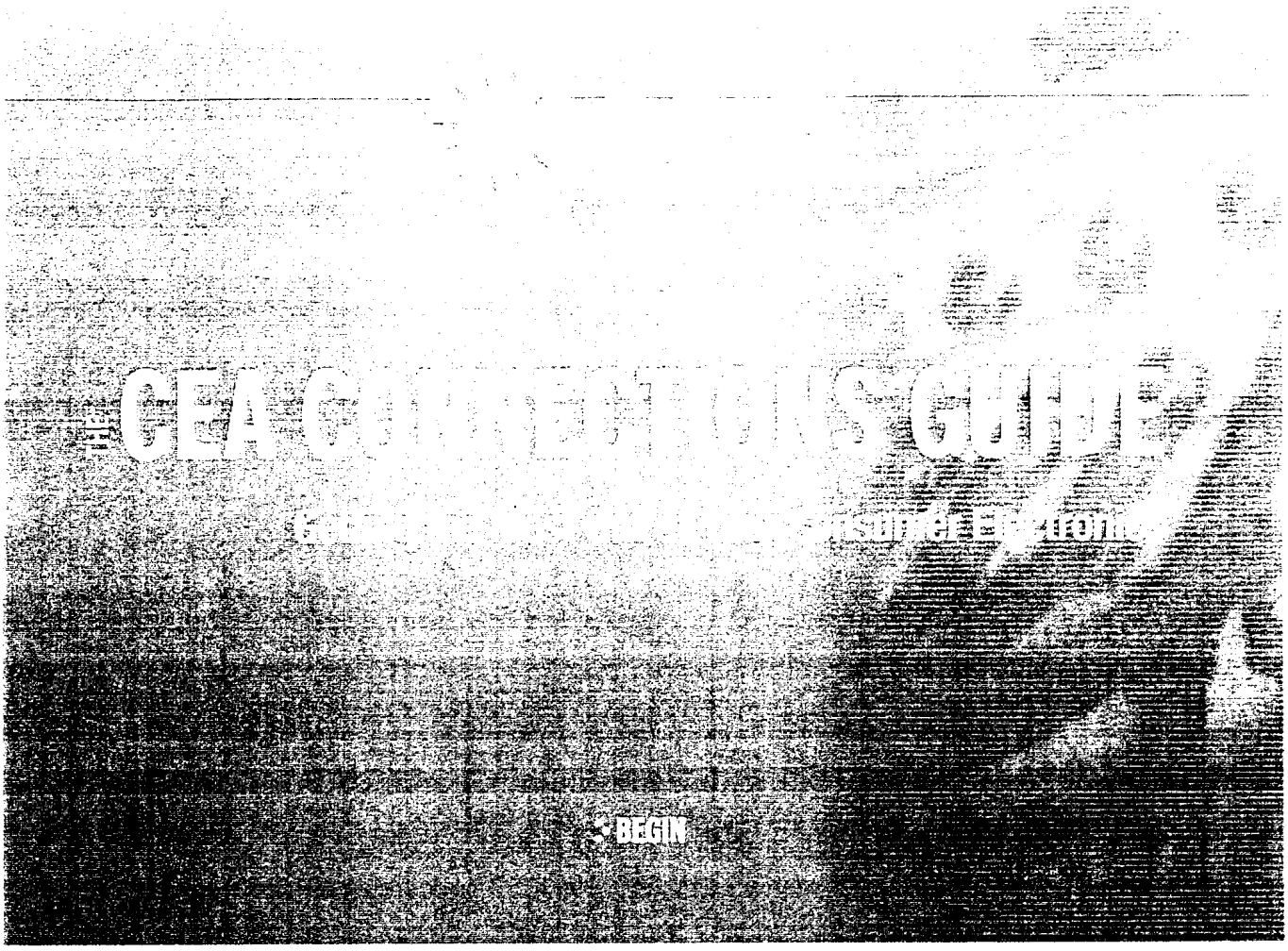
2500 WILSON BLVD
ARLINGTON VA 22201-3837

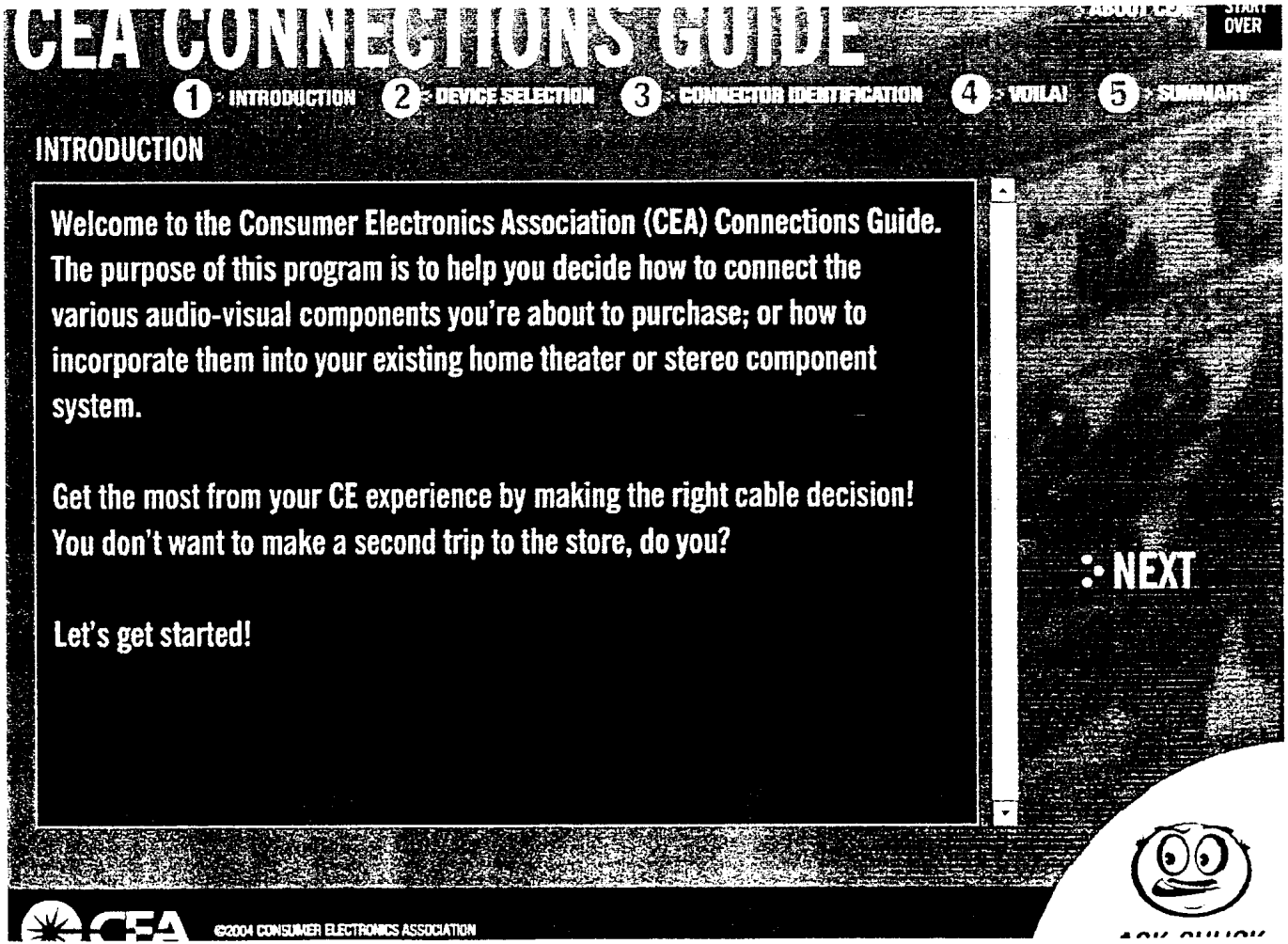
Close Window

CLICKING ON THE MAP WILL: ○ Zoom In ◉ Move Location

Note: Channel numbers displayed on the map are those shown in the "Frequency Assignment" column in the stations table.

The map shows the distribution of stations around your address. When installing an antenna, you should point your antenna or align your antenna's rotor system to point in the direction of the stations of interest.* The compass arrow in the lower left can help match the orientations on the "Stations" page to the map: the compass arrow shows the direction of magnetic North. Orientations start at 0° (North) and increase clockwise to 360° (North again). So, North-East is 45°, South-East is 135°, etc.


BEGIN


CEA CONNECTIONS GUIDE
START OVER
1 INTRODUCTION
2 DEVICE SELECTION
3 CONNECTOR IDENTIFICATION
4 VOILA!
5 SUMMARY
INTRODUCTION
Welcome to the Consumer Electronics Association (CEA) Connections Guide. The purpose of this program is to help you decide how to connect the various audio-visual components you're about to purchase; or how to incorporate them into your existing home theater or stereo component system.
Get the most from your CE experience by making the right cable decision! You don't want to make a second trip to the store, do you?
Let's get started!
NEXT
CEA
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CEA CONNECTIONS GUIDE

OVER

1 : INTRODUCTION 2 : DEVICE SELECTION 3 : CONNECTOR IDENTIFICATION 4 : VOILA! 5 : SUMMARY

INTRODUCTION

Welcome to the Consumer Electronics Association (CEA)
The purpose of this program is to help you decide h
various audio-visual components you're about t
incorporate them into your existing home thea
system.

Get the most from your CE experience by m
You don't want to make a second trip to the

Let's get started!

ASK CHUCK

INTRODUCTION

I'm Chuck! I'll be here in the lower right-hand of your screen to help provide answers to typical questions about connecting your CE products and pointing out features of the program. Whatever your inquiry, just click on "Ask Chuck" and I'll see if I have the answer to your question(s). Remember, if you need anything, just Ask Chuck!

CEA CONNECTIONS GUIDE

START OVER

1 : INTRODUCTION 2 : DEVICE SELECTION 3 : CONNECTOR IDENTIFICATION 4 : VOILA! 5 : SUMMARY

DEVICE SELECTION

In order to help you select the best connection scheme for your components, we need to know what components you have. Check all the components you wish to connect and click Next. If you're not sure which components you need (receiver or no receiver?), just Ask Chuck. I tell you, that guy's a genius.

TV	A/V RECEIVER	DVD PLAYER
VCR	SET-TOP BOX	CD PLAYER
TURNTABLE	TAPE PLAYER	DIGITAL VIDEO RECORDER

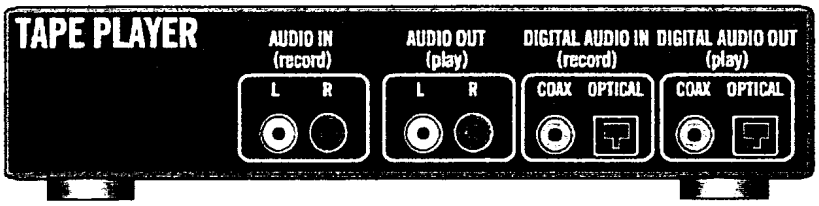
: NEXT

ASK CHUCK

START OVER

"none"

AUDIO
Composite (RCA)
Digital Audio



BACK : NEXT

CEA CONNECTIONS GUIDE

OVER

1 : INTRODUCTION 2 : DEVICE SELECTION 3 : CONNECTOR IDENTIFICATION 4 : VOILA! 5 : SUMMARY

NO AUTOGRAPHS, PLEASE

Almost there...we're coming down the home stretch. Your next step is to click the pair of components you would like to see, and we'll show you how they're hooked up. When you're finished viewing all the component pairs below, click NEXT to see a summary of components and connections. Go ahead, don't be shy...

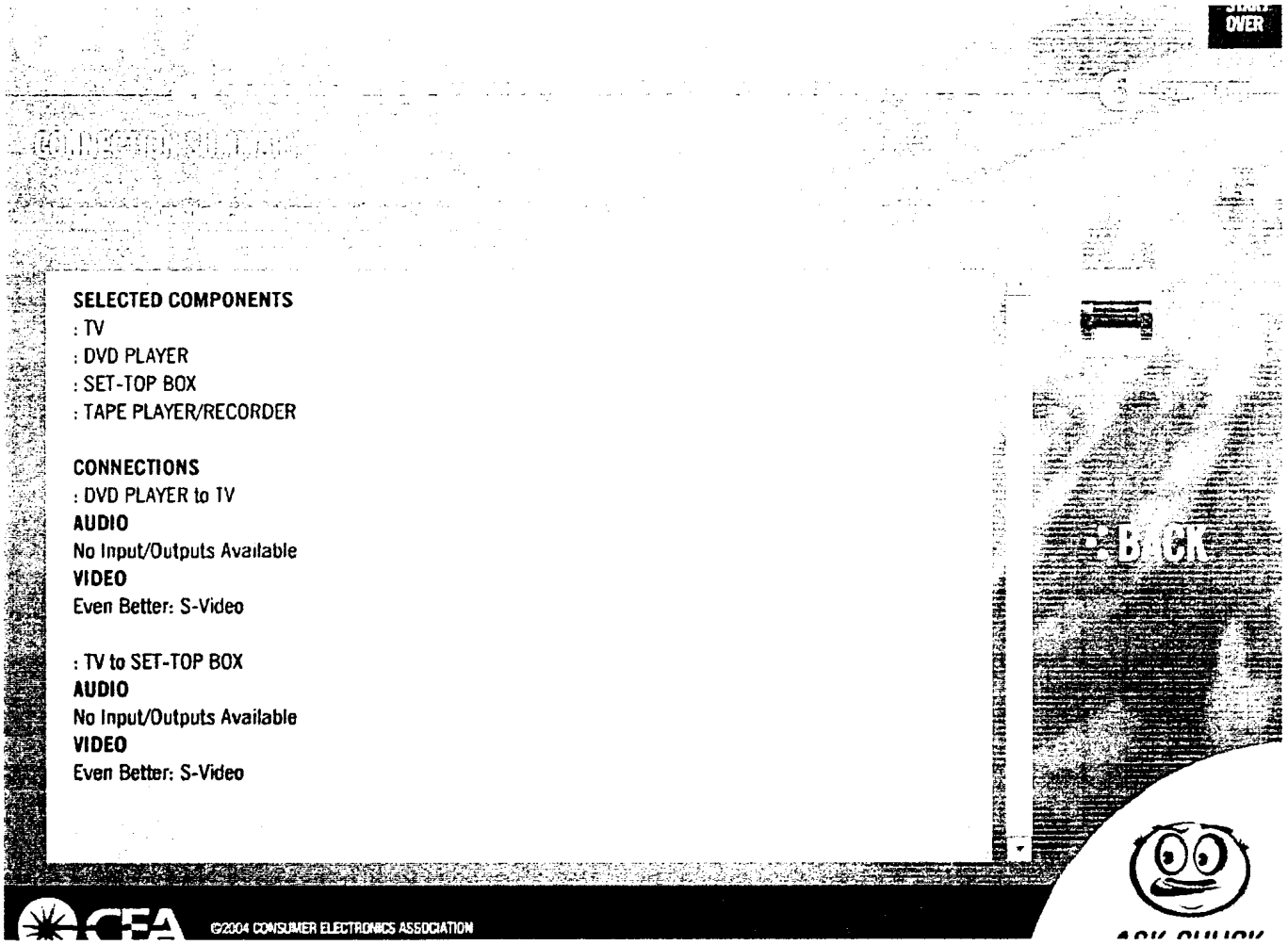
SELECTED CONNECTIONS

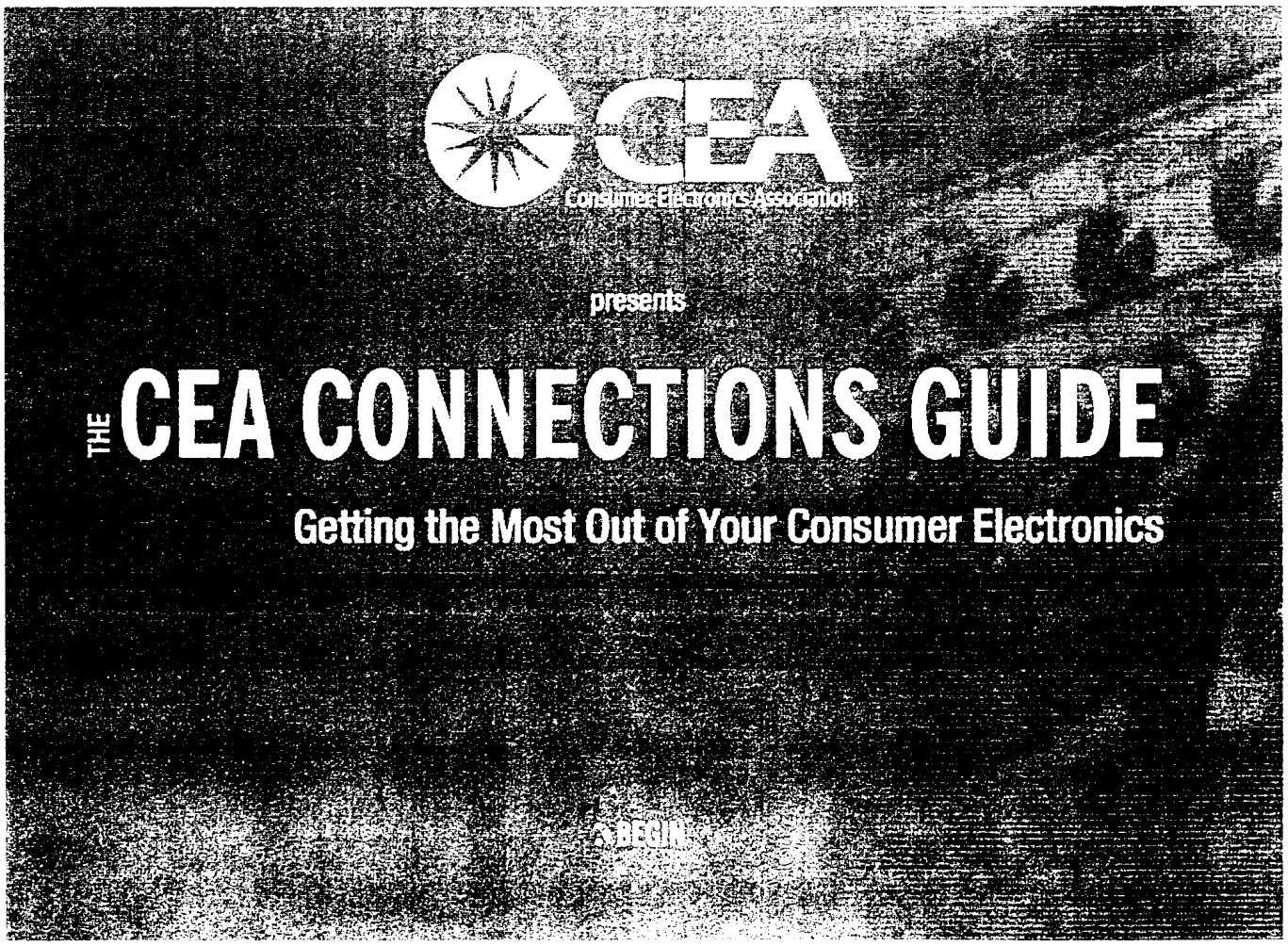
DVD PLAYER to TV

TV to SET-TOP BOX

: NEXT

: BACK


START OVER
SELECTED COMPONENTS
: TV
: DVD PLAYER
: SET-TOP BOX
: TAPE PLAYER/RECORDER
CONNECTIONS
: DVD PLAYER to TV
AUDIO
No Input/Outputs Available
VIDEO
Even Better: S-Video
: TV to SET-TOP BOX
AUDIO
No Input/Outputs Available
VIDEO
Even Better: S-Video
BACK
CEA
©2004 CONSUMER ELECTRONICS ASSOCIATION


CEA
Consumer Electronics Association
presents
THE CEA CONNECTIONS GUIDE
Getting the Most Out of Your Consumer Electronics
BEGIN

HDTV

Turn It On

FOR RELEASE

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CEA ANNOUNCES 2004 WINTER/SPRING HDTV INITIATIVES

CONSUMER EDUCATION REMAINS PRIMARY FOCUS

Las Vegas, Nev., January 9, 2004 – The Consumer Electronics Association (CEA) today announced its latest high-definition television (HDTV) initiatives for the coming months focusing on consumer education, retailer training, point-of-sale materials and digital cable ready (DCR) HDTV. News about CEA's HDTV plans follows the successful introduction of a new HDTV consumer education video, "A Consumer's Guide to HDTV," produced by CEA's DTV Subdivision in conjunction with the Comcast Media Center. Both announcements underscore the excitement surrounding HDTV at the 2004 International Consumer Electronics Show (CES) being held here at the Las Vegas Convention Center (LVCC), January 8-11.

"From the new CEA-Comcast consumer video to the continuation of the regional HDTV Updates, CEA is truly bridging the HDTV information gap across the country for consumers and industry alike," said CEA President and CEO Gary Shapiro. "With six years of proactive HDTV promotion and education initiatives under our belt, 2004 promises to be our biggest year yet as we expand upon our solid consumer programs dedicated to explaining the analog to digital transition and we look forward to working with our industry colleagues to develop new projects this year."

CEA Media Spokesman Jim Barry will detail past and future CEA promotional programs with CES attendees today at 3 pm Pacific Time during the HDTV conference session – 'Consumer Education: The Final HDTV Frontier' (LVCC room N264).

During March, CEA will demonstrate the wonders of HDTV to some 50,000 consumers at the New Orleans Home Show. In addition to the various DTV products highlighted, CEA also will include its TechHome display, which features an HDTV plasma and demonstrates the various home networking solutions. Throughout the home show, CEA's Jim Barry will present educational seminars to help consumers better understand DTV. Consumer education materials, including the "Consumer's Guide" DVD and the *HDTV Guide*, which provides a complete index of all DTV products currently on the market, will be available to home show attendees.

Also in March, the Eighth Annual HDTV Summit – Partnership, Policy and Profits – will be held at the Washington, DC Convention Center on March 29 bringing together DTV government officials, industry leaders and market research experts to discuss, among other things, the remaining obstacles in delivering information about HDTV to consumers.

CEA's consumer print brochure, "A Consumer's Guide to the Wonderful World of HDTV" also will be distributed at the home show and other HDTV-related events. The brochure has been updated to include more information about cable plug-and-play or "digital cable ready"

(DCR) products, as well as the latest digital display technologies. This new print version of the "Consumer Guide" will be posted online at www.ce.org/hdtv, as a PDF file, as well.

Collaboration with retailers to provide point-of-sale informational materials to both consumers and retail staff remains a high CEA priority in 2004 as well. This year also will mark the launch of CEA's new online DTV/HDTV training and certification program for retailers. Part of CEA's larger, industry-wide retail certification initiative known as "CE Know How," the HDTV component is expected to debut in March and will provide retailers with the product sales knowledge needed to support HDTV consumers at point-of-sale.

CEA also reported it now has visited the top 25 DTV markets – as measured by DTV activity in the market, i.e. broadcasters on-air and cable carriage, among others – with its popular "HDTV Update" program, which brings together local retailers, broadcasters, cable companies and other DTV leaders to discuss the analog to digital transition. Sponsored by CEA's DTV Subdivision, the HDTV Updates will be expanded in 2004 to include buying groups in Atlanta, Ga., New Orleans, La., Orlando, Fla., San Antonio, Tx; and Scottsdale, Az. Additional HDTV Updates also are being scheduled for later in the year.

CEA and Comcast announced at the 2004 International CES that they have partnered to co-produce a consumer educational DVD about HDTV. The 10-minute informational DVD is available to consumers at various CEA events and by request at www.ce.org/hdtv. Additionally, to highlight the difference high-definition makes and to provide additional point-of-purchase information for consumers, Comcast will deliver a three-minute HDTV version to retailers across the country.

For the latest information about CEA's HDTV initiatives, please visit www.ce.org/hdtv.

About CEA:

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the consumer technology industry through technology policy, events, research, promotion and the fostering of business and strategic relationships. CEA represents more than 1,200 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $90 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

CEA also sponsors and manages the International CES – Defining Tomorrow's Technology. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

UPCOMING EVENTS

- **International CES – Defining Tomorrow's Technology**
  January 8-11, 2004, Las Vegas, NV
- **CEA Winter Technology & Standards Forum**
  February 22-27, 2003, Ft. Lauderdale, FL
- **CEA Winter Summit**
  February 26-29, 2004, Aspen, CO
- **Spring Electronic House Expo (EHX)**
  March 11-13, 2004, Orlando, FL
- **CEA HDTV Summit**
  March 29, 2004, Washington, DC
- **CONNECTIONS**
  May 5-7, 2004, Dallas, TX
- **Consumer Electronics CEO Summit**
  June 23-26, 2004, Huntington Beach, CA

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FOR RELEASE

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CEA AND COMCAST MEDIA CENTER UNVEIL CONSUMER EDUCATION HDTV VIDEO – AT 2004 INTERNATIONAL CES

"CONSUMER'S GUIDE TO HDTV" AVAILABLE TO RETAILERS AND CONSUMERS

Las Vegas, Nev., January 8, 2004 – Joining forces to help bring consumers more information regarding the analog to digital television (DTV) transition, the Consumer Electronics Association (CEA) and the Comcast Media Center (CMC) today unveiled a consumer-oriented video about high-definition television (HDTV) technology at the 2004 International Consumer Electronics Show (CES). The 2004 International CES runs today through Sunday, January 11, at the Las Vegas Convention Center (LVCC).

Produced in high-definition (HD) and displayed in the CES HDTV Sports Bar, located in the LVCC South Hall Upper Level Lobby, the "Consumer's Guide to HDTV" video is based on CEA's original print brochure titled, "A Consumer's Guide to the Wonderful World of HDTV." CEA is making the video available to a wide audience, including consumers, in standard-definition DVD format. The video is available to retailers from CMC in HD format.

In the video, Suzanne Kantra, technology editor for *Popular Science Magazine* and a member of the 2004 International CES Advisory Committee, and Jim Barry, the media spokesman for CEA who has been leading its *HDTV Updates* in local markets nationwide, guide consumers through a menu of eight segments, including: "What is HDTV?," "How Do I Receive it?," "Digital Cable Ready HDTV" and "Digital TV Shopping Guide." The video also includes Internet resources providing further information for consumers.

"This new HDTV video guide is a stand-out addition to CEA's ever-expanding HDTV consumer education programs," said CEA President and CEO Gary Shapiro. "Having a guide to HDTV that uses HD technology is a perfect way to give consumers the information they need at the time and place they need it most – at the retail point-of-sale. By making the content available in DVD as well, we are offering consumers the opportunity to review the information in the comfort of their own home."

According to sales figures from CEA Market Research, more than 8 million DTV units have been sold since DTV was introduced in the fourth quarter of 1998. The increasing array of HDTV programming available via digital cable, satellite and over-the-air is further propelling the DTV transition forward.

more

"CEA recognizes that as consumer interest and demand continue to grow, it's important to provide accurate and timely information," Shapiro continued. "We also appreciate Comcast Media Center's support and participation in our growing HDTV education initiative, which will help to increase consumers' and the retail industry's access to our informational materials. Inter-industry cooperation is essential to help consumers better understand the value and benefits of DTV."

"We were very impressed with the efforts that CEA is making to educate consumers about HDTV and viewed collaborating on the HDTV video as a great way to lend support while demonstrating our HDTV production and distribution capabilities," said Gary Traver, senior vice president and COO for the CMC.

Copies of the "Consumer's Guide to HDTV" DVD are available in the HDTV Sports Bar located in the LVCC South Hall Upper Level Lobby at the 2004 International CES. In addition, copies of the video are available by request from CEA or at upcoming CEA HDTV events posted online at www.ce.org/hdtv. More information about the "Consumer's Guide to HDTV" and CEA's comprehensive HDTV program is available online at www.ce.org/hdtv.

About CEA:

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About Comcast Media Center:

Comcast Media Center (CMC), a unit of Comcast Cable, provides standard definition and HDTV network origination services, global transmission via satellite and terrestrial fiber optics, broadcast quality studio, mobile and post production services, interactive applications and streaming distribution capabilities. CMC's HITS (Headend in the Sky) digital platform, founded in 1994, delivers 150 digital services to more than 2,000 cable system headends. More information is available at: http://www.comcastmediacenter.com/

Headquartered in Philadelphia, Comcast Cable is a division of Comcast Corporation, a developer, manager and operator of broadband cable networks and provider of programming content. Operating in 17 of the United States' 20 largest metropolitan areas, Comcast is one of the leading communications, media and entertainment companies in the world. Providing basic cable, digital cable and high-speed Internet services, Comcast Cable is the company to look to first for the communications products and services that connect people to what's important in their lives. The company's 55,000 employees serve more than 21 million customers.

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HDTV

Turn It On

FOR RELEASE

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CO-HOSTED "HDTV UPDATE" AND IN-STORE EDUCATIONAL SEGMENTS TOP CEA'S LATEST HDTV PROMOTIONS

PREVIOUSLY ANNOUNCED CEA "HDTV UPDATE" FALL SCHEDULE EXPANDED TO INCLUDE INDIANAPOLIS DURING CEDIA EXPO 2003

Arlington, Va., August 5, 2003 – The Consumer Electronics Association (CEA) today announced two additional initiatives aimed at accelerating the analog to digital television (DTV) transition through greater consumer awareness and understanding of high definition television (HDTV). CEA previously outlined a host of ongoing promotions in a letter sent to the Federal Communications Commission (FCC). The latest initiatives to top the list include an additional HDTV Update market and a point-of-sale educational campaign produced by in-store media network Premier Retail Networks (PRN), The NBC Agency and CEA.

Expanding upon the existing HDTV Update fall program schedule, CEA is working in association with the Custom Electronic Design and Installation Association (CEDIA) to co-host an HDTV Update meeting during CEDIA EXPO 2003 in Indianapolis, IN, September 3-7, 2003.

The meeting, which will be held on Friday, September 5 from 10:00 am to 11:30 am in the Lincoln Room of the Marriott Hotel, will allow EXPO attendees and local digital television (DTV) leaders – broadcasters, retailers, local cable operators and more – to hear the latest statistics and sales trends from CEA. Local participants also will discuss the latest developments in the analog to DTV transition, while CEDIA guests from across the country may offer additional market insights.

The HDTV Update meetings are open to anyone in the retail, broadcast, cable and content or programming industries, involved in the HDTV transition. Anyone interested in attending the CEDIA EXPO 2003 HDTV Update meeting or other fall HDTV Update programs should contact Bob Loder, Golden Loder Associates, (908) 889-8300 x121, or bloder@goldenloder.com.

CEA also notes that, beginning in August, consumers visiting Best Buy, Circuit City and Sears will be able to learn about HDTV through educational segments produced by PRN, CEA and The NBC Agency. The segments, collectively known as "This Is HDTV," explain HDTV in consumer-friendly language and will run on analog and high definition television to offer side-by-side video and audio comparisons.

"These educational elements are critical to the HDTV transition," said CEA President and CEO Gary Shapiro. "Earlier this summer, CEA and our manufacturer members sent letters to the FCC outlining just a smattering of the HDTV promotions we have been spearheading since before the transition even got underway. The HDTV Update at CEDIA and the phenomenal educational segments at point-of-sale are just the latest demonstration of the consumer electronics industry's leadership and enthusiasm for HDTV."

More information about CEA's HDTV programs is available online at www.ce.org/hdtv.

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About CEDIA

CEDIA is a global trade association of companies that specialize in designing and installing electronic systems for the home. The association was founded in September 1989 and has approximately 2,500 member companies worldwide. CEDIA members are established and insured businesses with bona fide qualifications and experience in this specialized field. CEDIA is a not-for-profit organization based in Indianapolis, Ind. For more information on CEDIA, visit the association's web site at www.cedia.org or call 1-800-669-5329.

UPCOMING CEA EVENTS

- ◊ **CEA 2003 Summer Technology & Standards Forum**
  August 4-8, 2003, Quebec, Canada
- ◊ **CEA 2003 Fall Conference and Industry Forum**
  October 12-15, 2003, Carlsbad, CA
- ◊ **2003 Fall Electronic House Expo (EHX)**
  November 11-13, 2003, Long Beach, Calif.
- ◊ **2004 International CES – Defining Tomorrow's Technology**
  January 8-11, 2004, Las Vegas, NV

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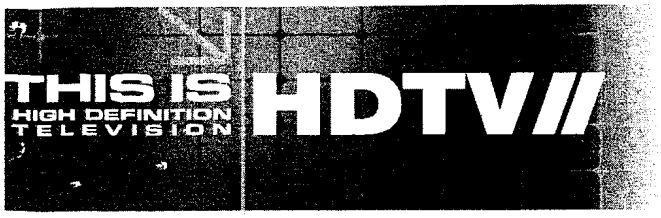

For Immediate Release

The NBC Agency and Premier Retail Networks
Announce
Nationwide High-Definition TV Information Campaign
to Educate Consumers

Initiative Endorsed by Consumer Electronics Association

Campaign to premiere August 1st in Best Buy, Circuit City and Sears

Burbank, CA, July 24, 2003 -- The NBC Agency, a unique, full-service advertising agency servicing the advertising and promotional needs of all NBC-owned entities including all promotion for NBC programs, is partnering with the Premier Retail Networks (PRN), creator of the world's largest in-store media networks, on a "High-Definition Television Information Campaign" designed to educate consumers on the benefits of high-definition (HD) television.

In addition to developing consumer awareness on the benefits of HDTV, the campaign also enables consumers to experience a side-by-side comparison of programming on HD and analog televisions. The campaign is designed to educate consumers about HDTV — what it is, and what are its benefits and features in comparison to analog television. The idea for the campaign began with PRN, who currently supplies customized programming in both analog and HD formats in all Best Buy, Circuit City and Sears stores across the country. The PRN Home Electronics Network is in over 2,000 stores nationwide and achieves over 12 million gross impressions each month (measured by Nielsen Media Research).

With nearly five times the sharpness of current NTSC-analog broadcasts and the same screen shape that would be seen in a movie theatre, HDTV delivers superb picture and audio quality. Conversion to HD is a driving force in shaping the future of television, for both the industry and the consumer, impacting how programming is delivered and viewed. The number of hours of HDTV programming by broadcasters is also on the rise; doubling from 2001 to 2002 to more than 2,000 hours. To date, according to the National Association of Broadcasters (NAB), the networks are programming approximately 2,500 hours of HD programming annually. This estimate does not include the HD programming that local stations are producing for their own markets, nor does it include cable/satellite network HD programming.

– more –

According to research from the Consumer Electronics Association (CEA), most consumers remain confused when it comes to HDTV. Only 27 percent of general consumers surveyed by telephone described themselves as very or somewhat familiar with HDTV. CEA research further shows that 46 percent of online survey respondents had read about or seen HDTV at a retail store, demonstrating the need for HDTV education at the point of sale where consumers are looking for that information.

"We are interested in supporting our retailers' efforts and enhancing consumer satisfaction by providing valuable information about HDTVs and HD programming, commented Charlie Nooney, Chief Executive Officer of Premier Retail Networks. "Noting a lack of consumer information on HDTV, we felt compelled to create a campaign that would bridge the HDTV educational gap. CEA has proved to be an invaluable information resource and NBC has stepped in to fill a crucial link in the chain by being the first broadcast network to help explain HDTV in electronics stores where consumers need the information most."

"When we learned about PRN's plans, we immediately wanted to be their creative partner," says Vince Manze, Co-President, The NBC Agency. "Not only did we feel we would be addressing a consumer need by educating viewers on how HDTV works, but we also embraced the opportunity to showcase the enhanced viewing experience of the NBC shows that are broadcast in HDTV."

Added Co-President, John Miller, "The fact that most NBC's scripted programming is produced in HD, we felt it was important to show the viewers how the programming would look in HD. We think the PRN segments do a good job of explaining the benefits of HD in a fun way - while showing off two high quality NBC dramas."

"HDTV sales have a strong momentum and with more programming available every day, the only disconnect in the HDTV equation is consumer education," said CEA President and CEO Gary Shapiro. "More than 1.3 million digital television (DTV) products have been sold in the first six months of 2003, but as our consumer research demonstrates, many consumers remain confused by the HDTV alphabet soup and the technology. This campaign masterfully explains HDTV in consumer-friendly language and, most important, does so at retail. CEA is proud to be associated with this project."

A series of entertaining HD education segments were produced by PRN, CEA and The NBC Agency and will be broadcast nationwide on PRN's networks in Circuit City, Best Buy and Sears. Talent from NBC's critically acclaimed programs including *American Dreams'* Tom Verica ("Jack Pryor") and *Boomtown's* Neal McDonough ("David

McNorris") serve as hosts. An HD version of the segments will run along side the analog version so that viewers can compare the vast difference in quality.

Watching the segments, consumers will learn for example, that a regular analog television image is made up of 150 thousand pixels, in a 4 by 3 aspect ratio. With HDTV, a wide screen format in a 16 by 9 aspect ratio, the pixels dramatically increase to one to two million; thus making for a larger, significantly sharper image; such as that seen in a movie theatre. Many HDTV programs will also be broadcast in multi-channel digital surround sound with a digital signal audio quality better than audio CDs.

The campaign entitled, "This Is HDTV," is to begin running in August 2003.

About The NBC Agency

The NBC Agency, founded in November, 1999, is a multi-award winning advertising team that made "Must See TV" a household slogan and reinforced the term "appointment television" for NBC programming. It is a unique, full-service advertising agency servicing the advertising and promotional needs of all NBC-owned entities which include entertainment, news, sports and corporate divisions of NBC as well as the cable, Internet and syndicated properties and brands that the company owns or holds an equity interest in such as CNBC, MSNBC and MSNBC.com, Bravo TV and NBC Enterprises.

About Premier Retail Networks (PRN)

Founded in 1993, PRN is the creator of the world's largest in-store media networks that reach and engage consumers while they shop in America's largest retailers. PRN partners with retailers and advertisers to create in-store television and interactive networks that broadcast news, product information, entertainment and advertising to viewers while they shop. By creating customized programming for retailers and advertisers, PRN builds brand equity, customer satisfaction and shopper loyalty. PRN programming is shown in over 5400 stores located in every state and DMA in the USA. PRN's retail partners include Wal-Mart, Circuit City, Best Buy, Sears, SAMs Club, FootAction USA, and Ralph's. Its Nielsen measured television and interactive networks deliver 170 million gross impressions each month. PRN's headquarters are in San Francisco, California. For more information, please visit http://www.prn.com.

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HDTV

Turn It On

FOR RELEASE

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or

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CEA PREVIEWS 2003 HDTV PROMOTIONAL PLANS

Arlington, Va., December 5, 2002 – Anticipating another banner year for digital television (DTV) product sales, the Consumer Electronics Association (CEA) today announced plans for high definition television (HDTV) promotional activities throughout 2003. These include HDTV update meetings for retailers, broadcasters and cable operators; home show exhibits and expansion of the Cinema Screen program, which promotes HDTV to movie audiences in "slides" displayed before the movie trailers and feature presentation.

"The DTV marketplace is thriving and our industry is proud to be at the helm of so many exciting promotional programs," said CEA president and CEO Gary Shapiro. "Many in the policy community have identified DTV consumer awareness and education as an obstacle to be overcome in the analog to digital transition. CEA and our entire industry have been and will continue to lead the way in that regard and so many more."

Bringing DTV transition parties together at the local level is a key element of the CEA educational and promotional program and CEA today announced it is continuing to build on the successful 2002 HDTV Update program by adding six new markets in the first half of 2003. The markets are Atlanta, Dallas, Miami, Tampa, Phoenix and Seattle. Earlier this year, CEA conducted HDTV Update meetings in eight markets across the country, including Philadelphia, Boston, Chicago, Minneapolis, San Francisco, Los Angeles, Detroit and Washington, D.C.

CEA's HDTV Update meetings give local parties – retailers, broadcasters and cable providers – an opportunity to discuss ways of working together to achieve greater consumer awareness of HDTV in their particular market. After visiting the six new markets in the spring, CEA will have visited 9 of the top 10 markets and 14 of the top 15 markets.

"These meetings have been an excellent opportunity for the people 'in the trenches' to sit down and talk with one another about their needs, especially as they relate to their own market," said CEA media spokesman Jim Barry, who leads the presentation during the HDTV Updates. "The local cable representatives who have attended have provided some of the most interesting information, because, of course, everyone wants to know when they can receive HDTV on cable."

"Our goal with these Updates is not only to allow local HDTV transition participants to hear about the national state of the transition from the consumer electronics community's perspective, but also to help make introductions, build inter-industry relationships and share

other markets' successes and programs," said Shapiro. "By all accounts, we're meeting those goals."

In addition to the expanded HDTV Update markets, CEA will distribute a monthly email newsletter to past HDTV Update attendees and others interested in moving the HDTV transition forward across the country. The newsletter will help facilitate continued dialogue between the attendees and allow CEA to share the latest information on HDTV with those on the "front lines" of the HDTV transition.

Soon after the 2003 International Consumer Electronics Show (CES), CEA will take HDTV on the road as part of an ongoing education and awareness project to reach mainstream consumers. CEA will showcase a sampling of HDTV home theater products available to consumers today at the Minneapolis Home Show, February 5-9. CEA previously has exhibited HDTV at home shows in cities including Chicago, Atlanta, St. Louis and New York as part of the industry's broad campaign to make as many consumers as possible aware of the incredible viewing experience that HDTV delivers.

Throughout the DTV transition, CEA also has been pleased to host and organize HDTV "watch parties" across the country when HDTV programming has become available. Looking to 2003, CEA plans to celebrate live HDTV broadcasts of major sporting events, such as the SuperBowl® XXXVII, Masters Golf Tournament and NCAA Final Four, with American consumers through more fun and exciting viewing events. More information about this program will become available as broadcasters announce their HD programming plans.

CEA will promote HDTV to a wide consumer audience through in-theater HDTV advertising slides, expanding upon a successful fall 2002 Cinema Screen movie promotion. Test market advertising through this campaign proved beneficial in getting the word out about HDTV home theater to consumers in the greater Washington, D.C. and Richmond, V.A. areas. CEA is investigating demonstrating HDTV home theater systems in some of the theaters, as well.

In addition to these consumer-oriented promotions, CEA again will provide a forum for government officials and industry leaders to discuss public policy issues that are crucial to the DTV transition. CEA's annual HDTV Summit will be held on March 10, 2003 in Washington, D.C. and will feature a special luncheon presentation of the 2002 Academy of Digital Television Pioneers Awards.

The Academy of Digital Television (DTV) Pioneers – the DTV Academy – is a select group of nearly 200 individuals who have played a significant role in the decade-long effort that has made digital television a reality for consumers. The DTV Academy includes individuals from the broadcasting, program development, consumer electronics manufacturing and retail industries, as well as present and former government officials and members of the media.

Each year, the Academy of DTV Pioneers honors excellence in all aspects of digital content development and delivery, analog to digital transition leadership, and high definition manufacture. A new category has been added for the 2002 DTV Awards program, which will

HDTV

Turn It On

American consumers to participate in celebrating HDTV. The People's Choice Award will recognize the HDTV program most loved by the public. Voting via CEA's website, www.CE.org/dtvacademy, will go live on January 9, from the 2003 International CES.

"CEA is pleased to be honoring members of the DTV Academy and 2002 DTV Award recipients at the HDTV Summit, as well as highlighting the best of HDTV throughout the calendar year," said Shapiro.

Sales of DTV products continue to rise as consumers see more HDTV programming. DTV products are defined by CEA as integrated sets and monitors displaying active vertical scanning lines of at least 480p and, in the case of integrated sets, receiving and decoding ATSC terrestrial digital transmissions. CEA has reported that 2002 DTV product sales through October total more than 1.8 million units. The total DTV product sales total since market introduction now stands at more than 4 million units, which represents consumer investment of more than $7.5 billion in just four years. CEA projects year-end 2002 DTV product sales to total 2.5 million units and 2003 sales to reach 4 million units.

About CEA:

The Consumer Electronics Association (CEA) represents more than 1,000 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $80 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

CEA also sponsors and manages the International CES – Defining Technology's Future. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

UPCOMING EVENTS

◊ **2003 International CES – Defining Technology's Future**
January 9-12, 2003, Las Vegas, NV

◊ **Electronic House Expo - Spring**
February 26-March 1, 2003, Orlando, FL

◊ **CEA 2003 Winter Technology & Standards Forum**
February 24-February 28, 2003, Scottsdale, AZ

◊ **2003 CEA Winter Summit**
March 4-6, 2003, St. Regis Aspen, Aspen, CO

◊ **HDTV Summit & the Academy of DTV Pioneers 2002 Awards**
March 10, 2003, Renaissance Hotel, Washington, DC

◊ **CEA 2003 Spring Leadership Retreat**
May 5-6, 2003, Grand Hyatt, Washington, D.C.

◊ **Connections 2003**
May 7-9, 2003, Fairmont Hotel, San Jose, CA

◊ **Asian Home Electronics Fair**
May 14-17, 2003, Shanghai, China

◊ **7th Annual Consumer Electronics CEO Summit**
June 18-20, 2003, Vail, CO

◊ **CEA 2003 Summer Technology & Standards Forum**
August 1-4, 2003, Location TBA

◊ **CEA 2003 Fall Conference and Industry Forum**
October 12-15, 2003, Carlsbad, CA

◊ **CEA 2004 Fall Conference and Industry Forum**
October 18-20, 2004, Location TBA

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HDTV

Turn It On

FOR RELEASE

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CEA ANNOUNCES HDTV PROMOTIONAL PROGRAM IN CONJUNCTION WITH CINEMA SCREEN MEDIA

Arlington, Va., September 25, 2002 – The Consumer Electronics Association, in conjunction with Cinema Screen Media, today announced it will promote High Definition Television (HDTV) to a wider consumer audience this fall when it begins advertising HDTV home theater in select theaters in Northern Virginia, Maryland and the Richmond, Virginia areas.

The spots will run on 98 Regal Cinema screens beginning October 4 and will run through December 27, 2002, totaling over 150,000 hits. In addition, CEA is investigating demonstrating HDTV home theater systems in some of the theaters.

"We are very excited about this promotion," said Jeffrey Joseph, vice president, communications and strategic relationships, for CEA. "This test program is an extension of our extensive 2002 HDTV promotional program aimed at educating the public about high definition television. Our goal is to make as many consumers as possible aware of the incredible viewing experience that HDTV delivers."

Throughout 2002, CEA has conducted an extensive consumer and retailer HDTV promotional program. Current and upcoming events and activities include:

- **Retail/Broadcaster/Cable Operator Update HDTV Meetings** were conducted in Philadelphia, Boston, Washington, D.C. this month. More than 150 retailers, broadcasters and cable operators have attended these training events led by Jim Barry, CEA's media spokesperson. Two additional update meetings will be held in San Francisco and Los Angeles in October.
- **An HDTV Video News Release** will be distributed nationwide in November promoting and explaining the benefits and features of HDTV.
- **A Consumer Electronics Show HDTV Sports Bar** will showcase some of the most exciting and compelling HDTV sports programming ever produced.
- **HDTV Sporting Events In The Nation's Capitol**. CEA is exploring opportunities to hold HDTV events in Washington DC later this year.
- **2003 DTV Summit** will be held on March 10, 2003 in Washington. CEA will announce programming details soon.

-more-

CEA ANNOUNCES HDTV PROMOTIONAL PROGRAM IN CONJUNCTION WITH CINEMA SCREEN MEDIA/2

Sales of DTV products are on track to exceed two million units this year and throughout 2002 have surpassed expectations. Sales in July rose 81 percent compared to the same period in 2001 representing a 66 percent dollar sales increase.

"As consumers become more aware of HDTV and its benefits, the numbers will continue to rise dramatically. We will continue to focus our efforts in getting HDTV in front of consumers," Joseph added.

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UPCOMING EVENTS

- ◊ **CEA Fall Conference and Industry Forum**
  October 13-16, 2002, San Francisco, CA
- ◊ **Electronic House Expo - Fall**
  November 11-14, 2002, Long Beach, CA
- ◊ **2003 International CES – Defining Technology's Future**
  January 9-12, 2003, Las Vegas, NV
- ◊ **Electronic House Expo - Spring**
  February 26-March 1, 2003, Orlando, FL
- ◊ **CEA 2003 Winter Technology & Standards Forum**
  February 24-February 28, 2003, Scottsdale, AZ
- ◊ **2003 CEA Winter Summit**
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  September 14-17, 2003, Carlsbad, CA

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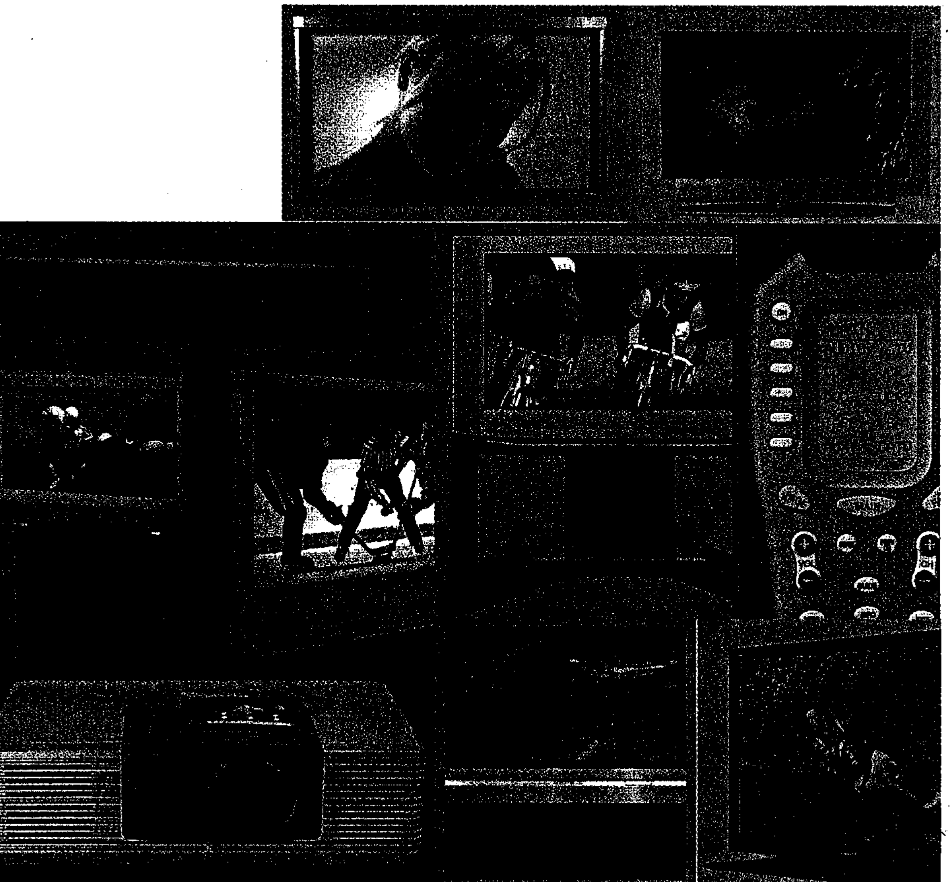
TRADE PUBLICATIONS

E-GEAR's **GUIDE TO**

Buying HDTV



Produced in Association with the Consumer Electronics Association

CEA

My first experience with high-definition television was about five years ago at an electronics expo, where large TVs were showing the most stunning footage of nature documentaries I'd ever seen. In those days, the products were outrageously expensive, programming was virtually non-existent, and the public — those who'd even heard of HDTV — were skeptical and confused.

Today, the HDTV picture is very different. The products are plentiful and affordable, HDTV programming is growing daily, yet the public is still skeptical and confused. Shopping for a TV has become more complicated, with so many more options than the old days of rotary dials and bunny ears. Will your next TV be plasma, CRT or LCD? What type of programming is available in your area and do you plan to bring it into your home by antenna, satellite or cable? It's no wonder lots of buyers are shaking their heads in frustration.

But it doesn't have to be that way. Equipped with the right information, anyone can select, use and enjoy today's HDTV products. That's why we teamed up with the Consumer Electronics Association to produce this guide to buying HDTV. Whether this is your first HDTV or a new addition to an existing system, you'll find helpful information in these pages. We've covered all the critical areas to make your entry into high-definition television as easy as possible. From the Frequently Asked Questions section to the Connections guide to the Glossary, our editors have provided everything you need to know to make an informed entry into HDTV.

If you have any questions, drop me a line.

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HDTV

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What is HDTV?

Fujitsu 42-inch plasma display

High-definition TV is is a revolution in the way we receive and experience television. HDTV delivers sharp almost-real pictures without ghosts, snow or interference. After you've let HDTV put you in the center of your favorite show, there's no going back to TV as usual.

HDTV is a subset of digital TV. That means that all HDTV is digital, but not all digital TV is HDTV. The digital part refers to the way the television signal is transmitted from the broadcaster or service provider to your house. The high-definition part refers to the resolution.

High-definition television has been in the works for quite some time now. The Federal Communications Commission (FCC) and TV manufacturers began researching HDTV back in the 1980s. By the early 90s, testing on digital television transmission standards was being conducted, and finally in 1996, the ATSC (Advanced Television Standards Committee) standard for broadcasting HDTV over the airwaves was approved. Starting around 1998, TV stations began broadcasting HDTV signals.

HDTV means better pictures

Standard analog TV is made up of 480 interlaced vertical lines. HDTV resolutions can be either 720 progressive vertical lines or 1,080 interlaced vertical lines. More lines mean a much more detailed and life-like picture. In addition, digital signals are 100 percent free of the ghosting or snowy images associated with analog TV. Some HDTV programs are so crystal clear that it looks like you're peering through a window.

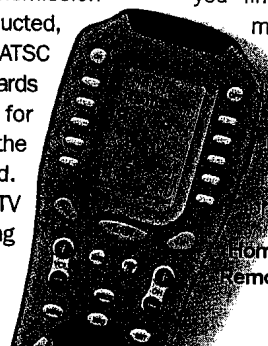
HDTV means widescreen

All HDTV programs, and most HDTV sets, are broadcast in widescreen, or 16:9 aspect ratio. The widescreen look, similar to screens in movie theaters, allows for a more intense viewing experience. When viewed on a standard TV screen (4:3 aspect ratio), HDTVs appear "letterboxed," with black bars at the top and bottom. When viewed on a widescreen TV, HDTV programs fill the screen.

HDTV means better sound

Enhanced video is just part of the HDTV picture. HDTV delivers 5.1 Dolby Digital surround sound, similar to what you find on most DVDs and in movie theaters.

Of course, all HDTVs with built-in speakers will play back in stereo, also, and most have features that provide virtual surround sound from just two speakers.



Home Theater Master 800 Remote

Samsung DLP rear projection TV

DVDs and HDTVs are perfect for each other

Another reason to love HDTVs is that they're perfect for connecting to DVD players. Virtually all HDTVs these days are widescreen, as are most DVDs. DVDs identified with such phrases as "Enhanced for wide-screen TVs," "Presented in 16:9 aspect ratio," or "Anamorphic" are specifically formatted to look their best on widescreen HDTVs.

New TV Display Technologies

The development of high-definition TV has also led to the development of better display technologies. While most HDTVs today are conventional cathode ray tube (CRT) designs, there are several impressive new display technologies well worth considering.

Plasma

Plasma TVs have received a lot of attention lately due to their sleek and sexy appearance. Despite their large screen sizes, they're ultra-slim. Plasma TVs come in sizes from 30 inches up to over 70 inches, with 50-inch being the most popular. Plasma TVs are bright enough to be viewed easily without turning down the lights. Because they use phosphors, plasma TV can be susceptible to "screen burn" when a static image (such as the score from a video game) is left on for extended periods.

LCD

LCD is the other type of flat TV that often gets confused with plasma. Like plasmas, LCD TVs are also thin, but they use liquid crystals and colored filters to create the picture. Because there are no phosphors, LCD TVs don't suffer from burn in. LCD TVs today are most common in sizes ranging from 13 to 22 inches, but a few models are now available up to 40 inches and beyond.

DLP

Texas Instruments developed the Digital Light Processing technology for business and home theater front projectors but DLP has become very popular in rear projection TVs. Using a fingernail-sized panel consisting of thousands of micromirrors DLP creates images by turning each one on and off very rapidly. DLP TVs and projectors aren't susceptible to screen burn, use very little electricity compared to plasma and CRT, and are usually quite bright.

LCoS

Liquid Crystal on Silicon is similar to LCD, except that instead of shinning a light from behind the LCD panel, LCoS TVs reflect the light off an LCD mounted on a silicon substrate. While currently less common than the other new technologies, expect to see more from LCoS as the HDTV revolution marches on.

Frequently asked questions

about HDTV

definition. Most of them require the use of external set-top-boxes, available from cable providers, and require that households subscribe to digital cable services. By the end of the year, you will be able to purchase high-definition cable-ready TVs that include a "plug-n-play" CableCard supplied by your local provider. CableCards bypass the need for a set-top box and provide direct access to your premium cable services. HD cable programming can include local affiliates of major networks, premium channels, such as HBO, HDTV and ESPN HD, as well as special channels like HDNet.

Q What HDTV resolution is better, 720 progressive or 1,080 interlaced?

A Neither. While experts and videophiles may disagree, most people can't tell the difference. Which looks better on a particular TV depends more on the performance of the TV's built-in video processor and its scaler than the native resolution of the programming.

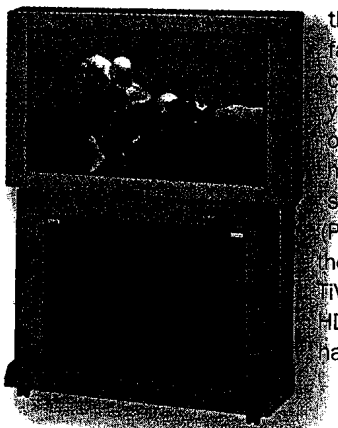
Q How much HD programming is available?

A A lot. There are HDTV programs for all tastes, from movies and documentaries to sports and sitcoms. Programming is available from local broadcasters, cable providers and satellite providers. Currently, there are at least 200 hours of HDTV available per week, including 70 hours of free, over-the-air programming from the major networks.

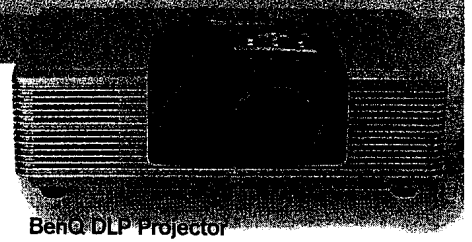
Q Can I record HDTV?

A Yes, but due to the very high resolution and large file sizes, there are only a few devices currently available for recording HDTV. Digital high-definition VCRs available from JVC, Marantz and Mitsubishi record HDTV onto digital VHS tapes in much the same way as standard VCRs. These D-VHS machines do not contain HD tuners and must be connected to compatible tuners. You should consult the dealer or manufacturer to find the combination that fits your needs. The other option is a high-definition personal video recorder (PVR) that, in much the same way as a TiVo device, records HDTV onto a built-in hard drive.

Panasonic 42-inch direct view



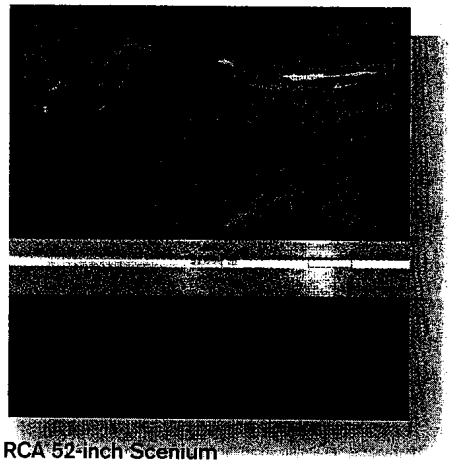
HDTV Shopping



BenQ DLP Projector

HDTVs are loaded with advanced features that weren't available in the analog days. Here are a few key features to look for and why. Many of these features go under different names depending on the manufacturer.

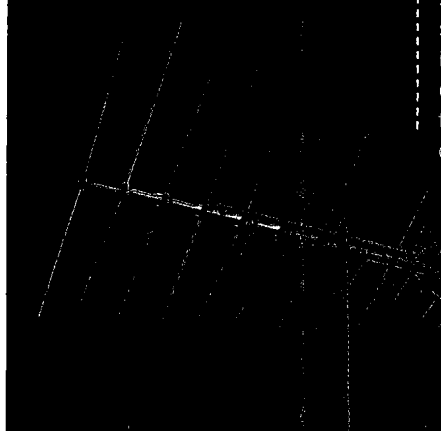
Size: Because of the near absence of scan lines and the tiny size of the pixels, you can generally view a larger HDTV from the same distance you would a smaller analog one. A good rule of thumb is to sit no closer than three times the screen height of the TV. Measure the seating distance in your home, and then look at a few TVs in stores from that distance.



RCA 52-inch Scenium

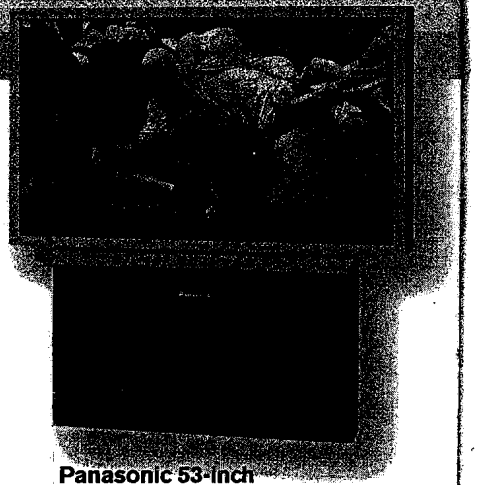
HDTV Tuner: Do you want to receive HDTV programming right

Accessories



Antennas. Unless you get your HDTV from your cable provider, you'll need some sort of antenna. They come in all shapes and sizes. If you want HDTV from satellite, you'll need a dish, which is a specific kind of antenna designed to capture signals transmitted from space. HDTV dishes are slightly larger than standard-definition dishes. In most cases the dish will be provided by your system installer. If you plan on getting HD signals from local over-the-air

Frequently asked questions about HDTV



Panasonic 53-inch rear projection display

Q What kinds of TVs are HDTVs?

A HDTV refers to the number of horizontal lines that can be displayed on the screen, not the technology upon which the TV is based. High-definition TVs can be standard direct-view tubes, slim LCDs and plasma monitors, as well as front projectors that require separate screens.

Q Is my current TV obsolete?

A Not really. The FCC has mandated that all TV broadcasts be converted to digital by 2007, but that date is almost certain to be extended. Even so, when all broadcasts are digital, manufacturers and service providers have agreed to make set-top-box converters available to "down-convert" the digital signals to analog, so that they are compatible with analog TVs. However, if you don't upgrade your television, you'll be missing out on a lot!

Q Is digital cable HDTV?

A No. This is the most persistent misconception out there today. What most cable companies promote as digital cable is simply standard-definition TV broadcast digitally, similar to digital satellite. The video and picture quality is usually superior to standard analog cable, but the resolution is still only a maximum of 480 interlaced lines — nowhere near the quality of high-definition TV.

Q What do I need to receive high-definition programming?

A To receive HDTV programs in your home you need an HDTV-ready television and an HDTV set-top-box tuner (either for off-air, cable or satellite programming), or an integrated HDTV that includes a built-in tuner that may receive off-air, cable, satellite signals, or some combination of the three. Satellite and cable HD programming require a subscription from the service provider.

Q How much can I expect to pay for an HDTV?

A As the technology matures, prices keep coming down, which is great for consumers. Currently, you can expect to pay from about $700 for smaller direct-view HDTV-ready sets to more than $20,000 for the best plasma displays and projectors.

Frequently asked questions about HDTV

Q What's the difference between enhanced definition (EDTV) and high-definition (HDTV)?

A HDTV includes picture resolutions of 1,080 interlaced and 720 progressive. EDTV resolution is 480 progressive, equivalent to the video output of progressive scan DVD players. EDTV looks much better than today's standard analog, but it isn't as good as HDTV.

Q What's the difference between an "integrated HDTV" and an "HDTV-ready" set?

A Most HDTV sets sold today are marketed as "HDTV-ready." That means they're able to display HDTV resolution signals and provide the proper inputs for external high-definition tuners. With an HDTV-ready set you have the freedom to choose the kind of high-definition tuner — cable, satellite or terrestrial — to pull in your HDTV signals. Integrated HDTVs (also called simply HDTVs or HDTV sets) include built-in high-definition tuners. Depending on the TV, the tuner may be compatible with off-air ATSC broadcasts (those that require an antenna), cable signals or satellite broadcasts that require satellite dishes.

Q What kind of inputs do I need on my HDTV?

A That depends on what you want to connect to it. For DVD players, you'll need a set of component inputs (best) or S-video inputs (good). For connecting an HDTV set-top box, your requirements will vary depending on the type of box you use. Newer HDTVs include a DVI input, which is compatible with today's high-definition satellite tuners and many off-air tuners. As cable companies get up to speed on HDTV, they will probably convert their set-top boxes to DVI as well. Currently, most HDTVs can accept HD signals via a component input, which is supported by most off-air tuners and cable boxes. HDTV signals cannot be passed through composite, RF, or S-video inputs.

Mitsubishi 82-inch Alpha Laser

Q Can I get HDTV from my cable company?

A In many cases, you can. At this time, cable providers in most metropolitan areas offer high-

away? Where do you get it? Find out if your local cable company offers it. If not look into over-the-air signals and antenna reception. If neither of those solutions suit you, then check out satellite HDTV. Or you can delay the tuner and just buy the TV to use with your analog signals — HDTVs also happen to be the best TVs for displaying analog content.

Aspect ratio control: This controls the picture shape. Because not everything you watch is going to be the same picture shape, you may want to change it to fit your TV and suit your tastes. Some aspect ratio controls distort the picture more than others.

Color temperatures: Most televisions have selectable color temperatures that are usually listed as cool, medium and warm: These settings adjust the hue of the whites displayed on the TV. The temperature of the whites affect the color quality of the entire picture. Ideally, new TVs should be calibrated to a color temperature of 65K (Kelvin). Check with your dealer and the manual for directions on how to adjust the color temperature of your HDTV.

Philips CINEOS LCoS Display

broadcasts, you need to pick up an antenna capable of receiving UHF signals. Depending on your location, you may be able to use a simple indoor table-top antenna costing under $20, or you may require a roof-mounted Yagi-type antenna with a motor to turn it in the direction of the station into which you want to tune. Several manufacturers offer slim stick-style antennas that can be mounted discreetly indoors or out, on a wall, under a windowsill or eave. Consult www.antennaweb.org for help finding the right antenna for your needs.

Cables. The quality of your digital television signal is greatly affected by the quality of the cable that you use to connect your set-top box to your HDTV. Rarely do TV set-top boxes ship with high-quality cables, so an immediate investment in cables will reap an immediate benefit in picture quality. Better cables have thicker insulation to defend against

HDTV Shopping

JVC DISH Network HDTV Receiver and PVR

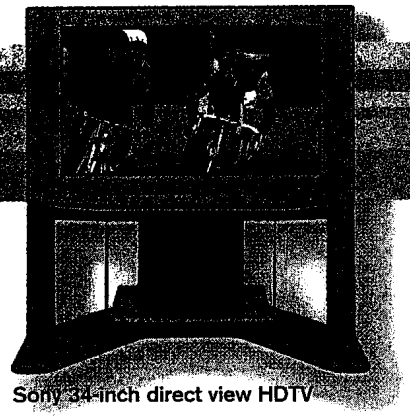
Black level enhancement: This goes under many names, but basically it allows the TV to display deeper blacks, giving you an overall richer picture.

De-interlacer: This feature takes a standard interlaced video signal made of two frames and combines them so that the TV displays them progressively, with all video lines shown at once. De-interlacing up converts analog signals to a higher-quality resolution for your TV. Often this feature is used in conjunction with 3:2 pulldown (also called 2:3 pull-down), which corrects errors common when converting film to video. Good de-interlacers remove jagged edges on TV images, giving you a smoother picture.

Runco 50 inch Plasma

radio frequency (RF) interference and electromagnetic (EM) interference, which can degrade picture and sound quality. Better cables also ensure greater signal integrity over longer lengths, allowing you more freedom in room and system layout.

Power Enhancement. Power source products for home entertainment come in two forms: those meant to protect your equipment from damage as a result of electrical surges and spikes, and those meant to "clean" or improve the quality of the power your equipment is using. Many products now perform both tasks to varying degrees. Simple surge protectors are the least you should consider when investing in HDTV entertainment gear. To get the highest-quality results out of your purchases, consider products that also help regulate the voltage, and enhance the electrical current feeding your gear.



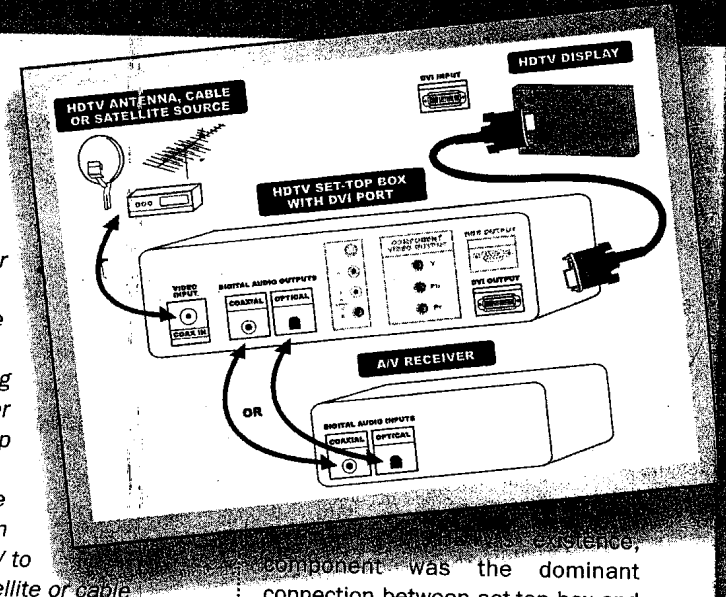
Sony 34-inch direct view HDTV

Digital noise reduction: DNR is also designed for analog TV signals and is sometimes found on DVD players and satellite/cable boxes. It filters out video noise. Sometimes this feature is manually adjustable to your liking.

Inputs/outputs: Make a note of what you plan to connect to the TV, and then plan ahead for things you don't yet own. You'll need at least one set of component inputs for a DVD player, an input for an HDTV tuner (either component or DVI), plus some other S-video and composite inputs for VCRs, video game machines, camcorders and maybe a PVR or DVD recorder. Front inputs are also helpful for camcorders and game consoles. Also make sure that the TV has the right audio inputs for your use. If you plan on using the built-in tuner, then look for audio outputs to connect to your surround sound receiver.

Advanced audio: Many TVs come with advanced audio circuitry to give you a better audio experience. Various virtual surround sound and three-dimensional sound processes offer the sonic illusion of surround sound if a full five-speaker surround sound system is not practical for your room. Some TVs even feature built-in subwoofers for better reproduction of special effects.

Remote controls. Chances are that your high-definition TV will be a part of a home entertainment system. You probably have a DVD player, surround sound receiver, cable set-top box, VCR, CD player and a video game console. This means you have half a dozen device remotes on a coffee table, and only one member of the family who knows how to use them. Universal learning remotes combine the functions of all those remotes into one, and do tricks called macros, in which one button press can do several functions at once, such as turn on multiple devices while switching the components to the correct inputs and outputs. Some universal remotes work by enabling built-in device codes, while others can be taught the functions of your existing remotes simply by pointing them at each other and following a few simple commands.

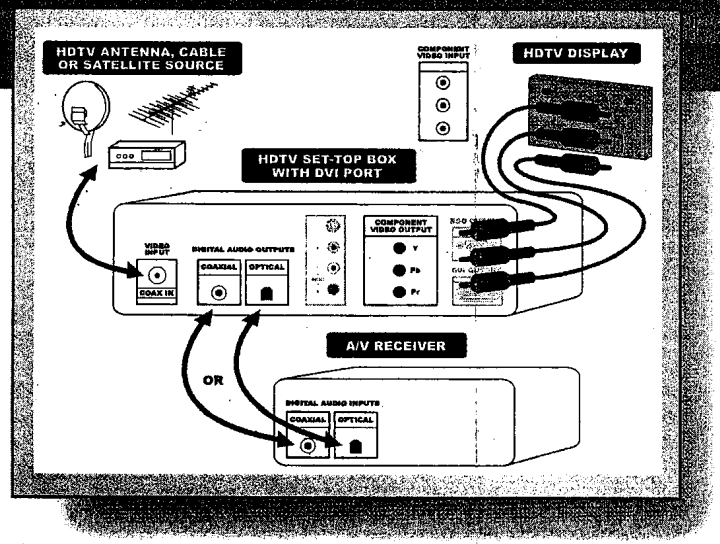


At this point in the development of HDTV, setting up and connecting your new TV isn't quite as simple as setting up a standard analog TV. On the other hand, setting up an HDTV isn't that much more demanding than connecting a TV to a standard satellite or cable set-top box.

Unless you have an HDTV with a built-in ATSC tuner, you'll need some sort of external set-top box to receive and decode the signals. HDTVs have more kinds of connections than analog TVs. The new connections, or jacks, are able to better handle the robust data streams of HDTV, and often include copy protection mechanisms to keep people from bootlegging broadcasted content. The following is a breakdown of the most common connections and their uses for HDTV.

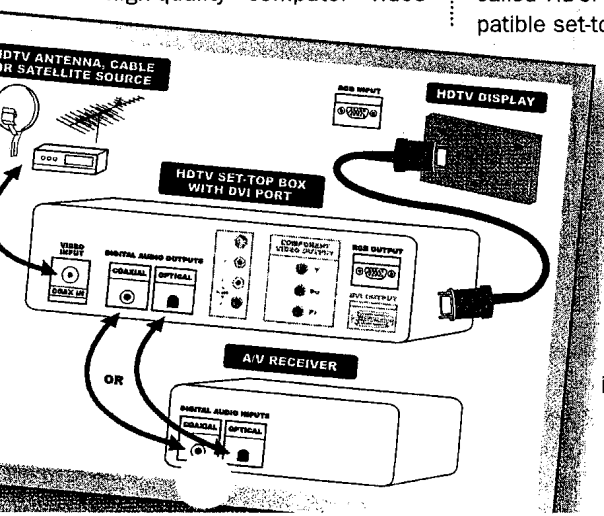
Component. This connection is actually three RCA cables — red, blue and green — that carry the HDTV signal in an analog form after it has been converted inside the set-top box. For the first few years of existence, component was the dominant connection between set-top box and TV. It's still pretty common, with most of the HDTV cable boxes out there still sporting component outputs. In order to use component connections, you must make sure the component input on your TV is able to accept a high bandwidth signal, sometimes called HD component or high-pass component.

IEEE 1394. Also called FireWire or i.Link, a 1394 cable transmits a compressed MPEG-2 signal from the set-top box to the TV. In order to work, the TV must have an MPEG-2 decoder built-in. The 1394 can be designed as a one-way or two-way connection. Two-way connections allow communication between devices, so, for example, your TV can send commands to your set-top box. A 1394 is also used for connecting to recording devices, such as a high-definition VCR.



VGA. This is the same 15-pin jack used to connect PCs to computer monitors. Sometimes it's referred to as RGB, because it carries the video signal in as three separate color signals (red, blue and green). Like component, this is an analog connection, but unlike component, it only features one cable.

DVI. Like VGA, DVI had its origins in the PC world for digitally connecting high-quality computer video outputs to PC monitors. DVI carries a very large, uncompressed digital signal. Because it is uncompressed, the signal is nearly impossible to record with currently available products. Because the signal remains digital from set-top box to TV, there are no opportunities for analog conversion errors to be introduced in the signal, ensuring a pristine picture. DVI inputs may include a copy protection scheme called HDCP which works with compatible set-top-boxes to ensure compliance with HDTV copyright laws.



HDMI. This is a variation of DVI, but has an easier-to-use end connector (similar to a USB cable) and carries audio as well as video. HDMI will begin to be introduced in products in 2004.

What's on HDTV

HDTV is available via antenna, cable and satellite. Free over-the-air HDTV is available to all of the top 100 television markets in the U.S., accounting for more than 98 percent of U.S. households. Almost 80 percent of the 106 million U.S. TV households reside in markets where five or more broadcasters send out free over-the-air digital signals (source: NAB). Major cable TV providers, including Time Warner, Comcast, Cox, Insight, Charter, Cablevision and Armstrong all offer high-definition services. Satellite TV services, including DIRECTV and Echostar (DISH Network), are available anywhere in the country with clear line of sight to the satellites in the southern sky. Both satellite companies offer several HDTV options, including pay-per-view movies.

Over-the-Air Broadcast

While the rollout of high-definition programming started a bit slowly, options have expanded. The major commercial networks (ABC, NBC, CBS and WB) offer about 50 hours of HDTV each week. FOX has been broadcasting in 480p enhanced definition, but will switch over to HD later this year. Most primetime dramas and sitcoms are broadcast in HDTV, as well as *ABC Saturday Night at the Movies*, *CBS Sunday Movies*, and ABC's *Wonderful World of Disney*. HDTV isn't just about sitcoms and movies, though. CBS's popular daytime soap *The Young and the Restless* has been broadcast in HDTV for a year now. You'll also find a lot of sports in HD, including NCAA college football and basketball, golf, tennis, the Stanley Cup, the NFL playoffs, the NBA finals and, of course, the Super Bowl. PBS also offers several specials in HDTV. Depending on your local cable provider, all of this HD programming is available free with an ATSC tuner and antenna.

Cable and Satellite

Cable and satellite companies offer a well-rounded mixed bag of HDTV, including HDNet (two channels of sports and movies), ESPN HD, Discovery HD Theater, Showtime HDTV and Bravo HD. Exactly which of these channels is available from your cable or satellite company differs from region to region.

Dishnetwork offers it's HD Pak for $9.99 (in addition to regular service) and includes ESPN HD, Discovery HD Theater, HDNet, HDNet Movies, HBO and Showtime HDTV, CBS HD and high-definition pay-per-view. DIRECTV's HD package, for $10.99 a month, offers the same channel line-up except for the high-definition CBS channel.

Early next year, a new satellite service called Voom, offered by Rainbow DBS, will begin broadcasting 21 HD channels and expects to increase to about 80 channels by the end of the year. Among the 21 initial channels offered will be 10 movie channels, and several sports channels, food,

		ABC	CBS	NBC	WB
Monday	8:00 p.m.		Yes, Dear		
	8:30 p.m.		Still Standing		
	9:00 p.m.	Monday Night Football	Everybody Loves Raymond	Las Vegas	Everwood
	9:30 p.m.		Two and a Half Men		
	10:00 p.m.		CSI: Miami	Third Watch	
	11:30 p.m.			Tonight Show	
Tuesday	8:00 p.m.	8 Simple Rules...	Navy NCIS	Whoopi	Gilmore Girls
	8:30 p.m.	I'm with Her		Happy Family	
	9:00 p.m.	According to Jim	Guardian	Frasier	One Tree Hill
	9:30 p.m.	Less than Perfect			
	10:00 p.m.	NYPD Blue	Judging Amy	Law & Order: SVU	
	11:30 p.m.			Tonight Show	
Wednesday	8:00 p.m.	My Wife and Kids		Ed	Smallville
	8:30 p.m.	It's All Relative			
	9:00 p.m.		King of Queens	West Wing	Angel
	9:30 p.m.		Becker		
	10:00 p.m.	Karen Sisco	Brotherhood of Poland, NH	Law & Order	
	11:30 p.m.			Tonight Show	
Thursday	8:00 p.m.	Threat Matrix			Run of the House
	9:00 p.m.		CSI		
	9:30 p.m.			Coupling	
	10:00 p.m.		Without a Trace	ER	
	11:30 p.m.			Tonight Show	
Friday	8:00 p.m.	George Lopez	Joan of Arcadia	Miss Match	Reba
	8:30 p.m.	Married to the Kellys			
	9:00 p.m.	Hope & Faith	JAG		Like Family
	9:30 p.m.	Life with Bonnie			
	10:00 p.m.		The Handler	Boomtown	All About the Andersons
	11:30 p.m.			Tonight Show	

Typical weekly prime time HDTV program schedule (courtesy of Titan TV)

fashion and music channels, a high-definition Playboy channel and other special interest channels such as cartoons, collectibles and art.

You can find details online about what your local cable company offers in HD programming.

D-Theater and HD DVD

In addition to the HDTV programming coming in from your antenna, satellite or cable box, you can also view pre-recorded HDTV movies in a format called D-Theater. These digital videotapes can be played on D-Theater compatible high-definition VCRs from manufacturer such as JVC and Marantz. The selection currently only covers less than 100 titles, but more are expected in outstanding quality. High-definition DVDs, most likely in a format called BluRay, are also anticipated in the next several years. In the meantime, you can enjoy 480p widescreen DVD content better than ever before on your HDTV.

3-2 pulldown processing

Sophisticated video processing common to digital TVs and progressive-scan DVD players. It corrects for artifacts and distortion that occur when film-based material (at 24 frames per second) is converted to video (30 frames per second), then de-interlaced to create a progressive-scan signal.

Anamorphic video

Video images that have been "squeezed" to fit a video frame when stored on DVD. These images must be expanded (un-squeezed) by the display device. An increasing number of TVs employ either a screen with 16:9 aspect ratio, or some type of "enhanced-for-widescreen" viewing mode, so that anamorphic and other widescreen material can be viewed in its proper proportions. When anamorphic video is displayed on a typical TV with 4:3 screen size, the images will appear unnaturally tall and narrow.

Artifacts

Unwanted visible effects in the picture created by disturbances in the video transmission or processing. Examples include "dot crawl" or "hanging dots" in analog pictures, or "pixelation" in digital pictures.

Aspect ratio

The ratio of width to height for an image or screen. The North American NTSC TV standard uses the squarish 4:3 (1.33:1) ratio. More and more direct-view and projection TVs (especially digital TVs) use the wider 16:9 ratio (1.78:1) to better display widescreen material such as anamorphic DVDs and HDTV broadcasts.

Audio/video inputs

Using a TV's direct A/V inputs to connect a DVD player, VCR, camcorder or other video component provides improved picture and sound quality compared to using the every-thing-on-one-wire RF antenna-style input. (If your TV is old enough that it only has RF-type inputs, you'll need an RF modulator since DVD players don't normally have RF outputs.

Rear A/V inputs are used for components you normally leave connected to your TV. Front A/V inputs allow you to quickly and easily connect/disconnect a camcorder, second VCR, or video game console.

Audio outputs

Stereo audio jacks that let you connect your TV to your stereo or home theater system. There are two types — fixed, and variable. If you connect a TV's fixed output to your A/V receiver, you'll be able to raise and lower the TV volume via the receiver's volume control. If you connect the TV's variable output to your receiver, you would control TV volume using the TV's remote.

ATSC

Advanced Television Standards Committee. Formed to establish technical standards for the U.S. digital television system.

Comb filter

A comb filter's task is to remove residual chrominance (color) information from the luminance (brightness) signal. Comb filtering enhances fine detail, cleans up image outlines, and eliminates most extraneous colors. Comb filters are not required and not used with S-video or component video connections since those connections carry the chrominance and luminance information separately. There are four types of comb filters found in today's TVs:

- GLASS - may also be referred to as an "analog" comb filter.
- TWO-LINE DIGITAL - compares consecutive scan lines within one field of video and makes adjustments to

reduce cross-color interference.

- THREE-LINE DIGITAL - compares three scan lines within a field of video. By comparing more picture information, a three-line filter further reduces color bleeding and dot crawl.
- 3D DIGITAL - not only analyzes consecutive scanning lines within a field, but also analyzes the preceding and following fields. This results in improved color purity and a more stable video image, and nearly eliminates dot crawl and color bleeding. Also called 3D Y/C.

Component video

See Making Connections on page 24.

Composite video

A single video signal that contains luminance (brightness) and chrominance (color) information. A composite signal is better than an RF signal, but not as good as S-video or component video. A composite video jack is usually a single RCA-type.

CRT

Stands for cathode ray tube. A CRT (or "picture tube") is a specialized vacuum tube in which images are created when an electron beam scans back and forth across the back side of a phosphor-coated screen. Each time the beam makes a pass across the screen, it lights up a horizontal line of phosphor dots on the inside of the glass tube. By rapidly drawing hundreds of these lines from the top to the bottom of the screen, images are created.

De-interlacing

The process of converting an interlaced-scan video signal (where each frame is split into two sequential fields) to a progressive-scan signal (where each frame remains whole). De-interlacers are found in digital TVs and progressive-scan DVD players. A more advanced de-interlacer includes a feature called 3-2 pulldown processing. De-interlacing is often referred to as "line-doubling" or "upconversion."

Digital audio output

A connection found on HDTVs and HDTV tuners for sending the Dolby Digital audio from HDTV broadcasts to an A/V receiver with Dolby Digital decoding. The two most common types of digital outputs are coaxial and Toslink optical.

Direct-view TV

The conventional and most common type of TV, which uses a single large (up to 40 inches) CRT to display images. Other TV types include rear-projection and front-projection.

DLP (Digital Light Processing)

See What is HDTV on page 10.

Dolby Digital

A discrete multichannel digital audio format that is the official audio standard for HDTV (and DVD). Dolby Digital is normally associated with 5.1-channel surround sound. Though this channel configuration is common, it is only one of several possible variations — a "Dolby Digital" soundtrack can mean anything from one to 5.1 channels.

DVI (Digital Visual Interface)

See Making Connections on page 24.

Front-projection TV

A two-piece display system consisting of a separate projector (often ceiling-mounted) and screen. Generally found in high-end home theaters, front-projection systems can display images up to 20 feet across, or larger. Types of front projectors include CRT, LCD, and DLP.

IEEE 1394 (also FireWire or i.LINK)

See Making Connection on page 24.

LCD (Liquid Crystal Display)

See What is HDTV on page 10.

Letterboxed video

A method for displaying the entire picture as seen in a movie theater. The resulting image width is much greater than its height. On a TV screen with a standard aspect ratio (4:3), letterboxed videos appear with horizontal black bars above and below the image.

MTS (Multichannel TV Sound)

The method of broadcasting stereo sound over ordinary analog TV channels. MTS reception capability is built into virtually all stereo TVs and HiFi VCRs.

Pan-and-scan

The process of transferring a movie or other source material to videocassette, DVD, or broadcast so that it fits the 4:3 aspect ratio of the NTSC system, as well as most current TVs. This results in a significant amount of lost picture information, particularly in the width of the image.

Picture-in-picture (PIP)

There are two basic types. The One-tuner picture-in-picture model requires that you connect a VCR or other video component to provide the source for your second picture. A two-tuner picture-in-picture model has two built-in TV tuners, so you can watch two shows at once using only the TV.

Pixel

Short for "picture element." The smallest bit of data in a video image. The smaller the size of the pixels in an image, the greater the resolution.

Plasma

See What is HDTV on page 10.

Progressive scan

Some digital television broadcast formats (720p, 480p), and some higher-end DVD players, use a type of video signal known as progressive scan. Instead of splitting each video frame into two sequential fields like standard interlaced NTSC video, progressive-scan video displays the entire frame in a single sweep. So, where standard NTSC video displays 30 frames (60 fields) per second, progressive scan displays 60 full frames per second.

Rear-projection TV

Typically referred to as "big-screen" TVs, these large-cabinet TVs generally have screens measuring at least 40 inches. Until recently, all rear-projection TVs used three CRTs, which projected images against a mirror inside the cabinet, so that the images were then reflected onto the built-in screen. Newer rear-projection technologies include LCD and DLP.

Resolution

The sharpness of a video image, signal or display, generally described either in terms of "lines of resolution" or pixels. The resolution you see depends on two factors: the resolution of your display and the resolution of the video signal. Since video images are always rectangular, there is both horizontal resolution and vertical resolution to consider.

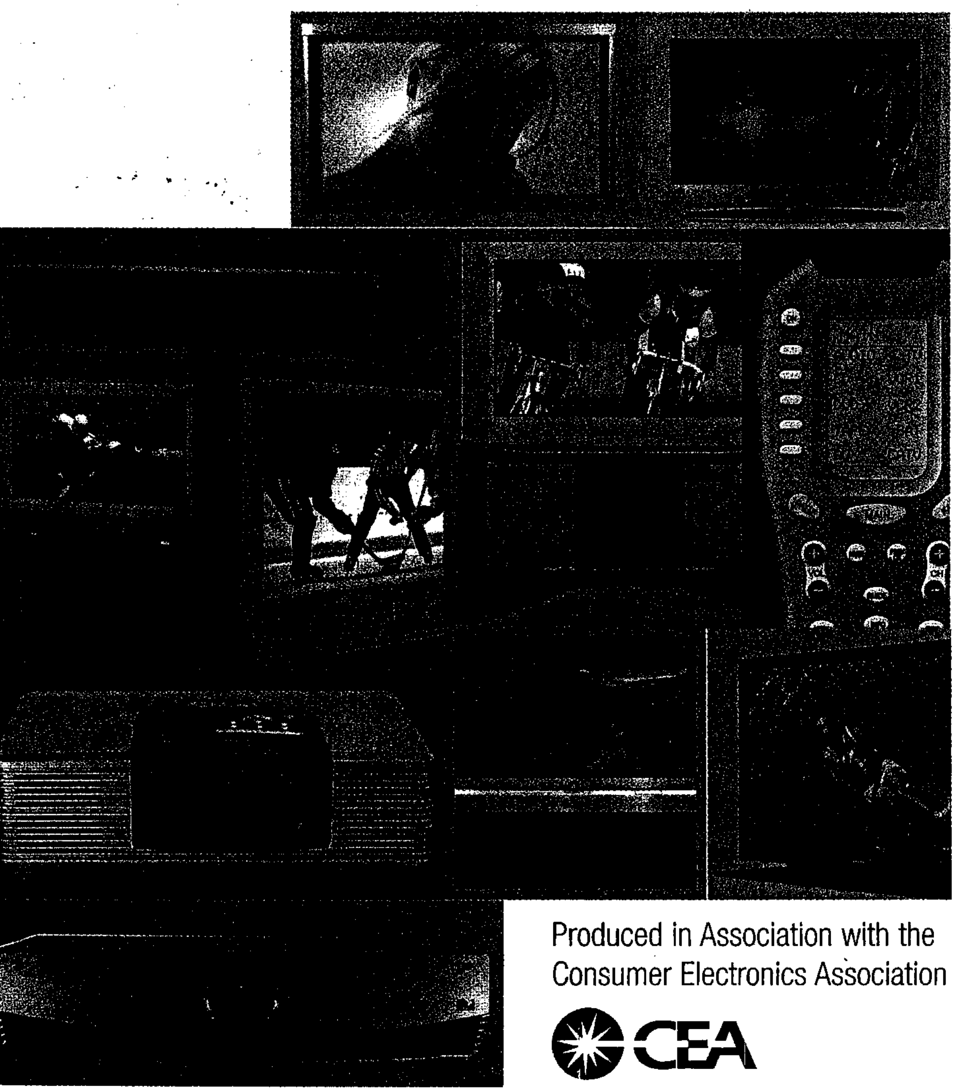
Set-top box

Also called converter boxes, these receivers convert broadcasts (either analog cable, digital cable or HDTV) for display on a television. HDTV-ready TVs (those without a built-in HDTV tuner) must be connected to a compatible HDTV tuner set-top box in order to receive digital television programs.

S-Video

Found on nearly all TVs sold, this four-pin connector usually provides a sharper, high-resolution picture by transmitting the chrominance and luminance portions of a video signal separately. The signals can then be processed separately, reducing interference. Direct S-video connections generally outperform composite connections when hooking up high-performance video components, like DVD players, S-VHS and Hi8 recorders and camcorders.

E-GEAR's GUIDE TO Selling HDTV



Produced in Association with the Consumer Electronics Association

CEA

HDTV

The HDTV revolution is being televised. Consumers are rapidly embracing this exciting new product category. More than seven million digital television (DTV) products have been sold to date and the Consumer Electronics Association (CEA) forecasts that unit sales will climb to 5.8 million in 2004, 8.3 million in 2005, 11.9 million in 2006 and 16.2 million in 2007. That exceeds the adoption rate of color TV, personal computers and the VCR.

Yet even with the impressive adoption rate, a few hurdles remain. Arguably the highest hurdle at this stage is the level of consumer confusion. Even as consumers become more familiar with DTV terminology and see more HDTV programming, it's natural that additional questions and points of confusion arise. Manufacturers, retailers and all parties with a stake in the transition must now go the extra mile to ensure everyone has accurate information about the analog to DTV transition.

To help meet this task, CEA partnered with North American Publishing to create this essential guide to selling HDTV. In these pages, you'll find best practice tips on marketing and selling HDTV as well as answers to the questions most frequently asked by consumers.

We hope you find the *HDTV Guide* useful. Check out **www.ce.org/hdtv** for the latest information on HDTV throughout the year. And don't forget to attend the 2004 International Consumer Electronics Show this January to see the latest and greatest in HDTV and consumer electronics.

Gary Shapiro
President and CEO
Consumer Electronics Association

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What is HDTV?

Fujitsu 50-inch plasma display

High-definition TV is a revolution in the way we receive and experience television. It's also a great opportunity for retailers to offer their customers exciting new products with improved performance and inovative features.

HDTV is a subset of digital TV. That means that all HDTV is digital, but not all digital TV is HDTV. The digital part refers to the way the television signal is transmitted from the broadcaster or service provider to the consumer's house. The high-definition part refers to the resolution — the number of lines and dots that make up the picture. The two most common formats of HDTV are 720 progressive and 1080 interlaced. Traditional standard definition TV, either analog or digital, is only 480 interlaced lines of resolution, at best. When those 480 lines are displayed progressively, it's called enhanced resolution (EDTV). Since high-definition TV offers so many more lines and dots, it offers the best resolution available.

HDTV means better pictures

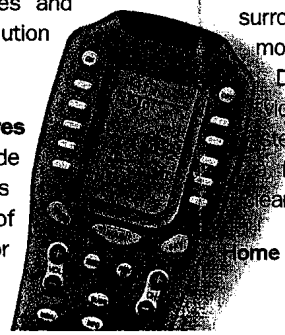
Standard analog TV is made up of 480 interlaced lines (vertical), for a total of 153,600 active "pixels," or picture elements. HDTV resolution can be either 720p (921,600 active pixels) or 1,080i (1,036,800 active pixels). More lines and more pixels mean a much more detailed and life-like picture. Some HDTV programs are so clear that it looks like you're peering through a window, while others are produced to resemble the quality of film in a commercial theater. In addition, digital signals are 100 percent free of the ghosting or snowy images associated with analog TV, no matter what the source.

HDTV is widescreen

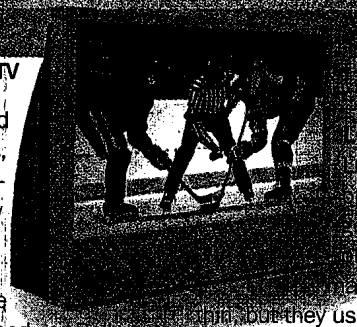
All HDTV programs, and most HDTV sets, are in widescreen 16:9 aspect ratio. The widescreen look, similar to screens in movie theaters, allows for a more intense viewing experience. When viewed on a standard aspect ratio TV screen (4:3), HDTVs appear letterboxed, with black bars at the top and bottom. When viewed on a widescreen TV, HDTV programs fill the screen.

HDTV sounds better

Enhanced video is just part of the HDTV picture. High-definition TV delivers 5.1 Dolby Digital surround sound, the same surround technology found in movie theaters and on most DVDs. Dolby Digital provides not only the two front stereo channels, but also a front center channel for clear dialog, two rear surround channels for background sounds and special effects, and a subwoofer channel for low bass and low frequency effects.



Home Theater Master 800 remote



Samsung DLP rear projection TV

To take advantage of the better sound, users need a Dolby Digital-compatible surround sound receiver and 5.1 speakers (the .1 is the subwoofer). All HDTVs with speakers will play back in stereo, too, and most have features that provide a virtual surround sound experience from just two speakers.

New TV Display Technologies

The development of high-definition TV has also led to the development of better display technologies. While most HDTVs today are conventional cathode ray tube (CRT) designs, there are several impressive new display technologies well worth considering.

Plasma

Plasma TVs have received a lot of attention lately due to their sleek and sexy appearance. Despite their large screen sizes, they're ultra-slim. Plasma TVs come in sizes from 30 inches up to over 70 inches, with 50-inch being the most popular. Plasma TVs are bright enough to be viewed easily without turning down the lights. Because they use phosphors, plasma TV can be susceptible to "screen burn" when a static image (such as the score from a video game) is left on for extended periods.

LCD

LCD is the other type of flat TV that often gets confused with plasma. Like plasmas, LCD TVs are also thin, but they use liquid crystals and colored filters to create the picture. Because there are no phosphors, LCD TVs don't suffer from burn in. LCD TVs today are most common in sizes ranging from 13 to 22 inches, but a few models are now available up to 40 inches and beyond.

DLP

Texas Instruments developed the Digital Light Processing technology for business and home theater front projectors but DLP has become very popular in rear projection TVs. Using a fingernail-sized panel consisting of thousands of micromirrors DLP creates images by turning each one on and off very rapidly. DLP TVs and projectors aren't susceptible to screen burn, use very little electricity compared to plasma and CRT, and are usually quite bright.

LCoS

Liquid Crystal on Silicon is similar to LCD, except that instead of shinning a light from behind the LCD panel, LCoS TVs reflect the light off an LCD mounted on a silicon substrate. While currently less common than the other new technologies, expect to see more from LCoS as the HDTV revolution marches on.

Frequently asked questions about HDTV

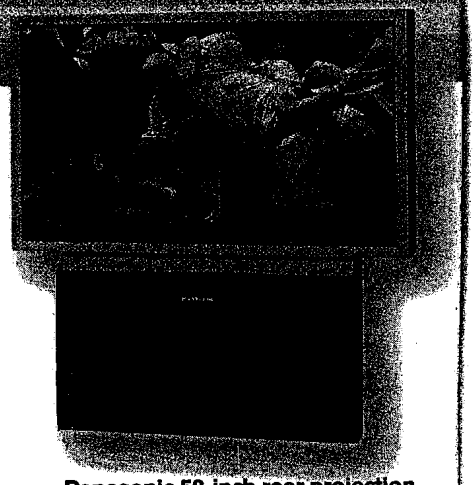
Q What kinds of TVs are HDTVs?

A High-definition refers to the video resolution (the number of horizontal lines in the video signal and displayed on the screen), not the technology upon which the TV is based. HDTVs can be standard direct-view tubes, large rear-projection TVs, slim LCDs and plasma monitors, as well as front projectors that require a separate screen. Make sure your customers are aware that not all digital TVs are capable of displaying high-definition resolutions. Many manufacturers promote misleading statements,such as "compatible with all HDTV resolutions" leading consumers to believe that lower resolution EDTVs are actually HDTVs.

Q Are analog TVs obsolete?

A Technically, no.The FCC has mandated that all TV broadcasts be converted to digital by 2007, but that date is almost certain to be extended. Even so, when all broadcasts are digital, manufacturers and service providers have agreed to make set-top-box converters available to "down-convert" the digital signals to analog, so they will be compatible with analog televisions.

Q Is digital cable HDTV?



Panasonic 52-inch rear projection

A No. This is one of the most persistent misconceptions out there today. What most cable companies promote as digital cable is simply standard definition television broadcast digitally, similar to digital satellite. The video and picture quality is usually superior to standard analog cable, but the resolution is still only a maximum of 480 interlaced lines — nowhere near the quality of high-definition. If your customers want HDTV, they'll need to purchase both a TV capable of displaying it and the appropriate tuner and service.

Q What's the difference between enhanced-definition (EDTV) and high-definition (HDTV)?

A This confuses a lot of people. HDTV resolutions are 1,080 interlaced and 720 progressive. The EDTV resolution is 480 progressive, equivalent to the video output of progressive scan DVD players. EDTV looks much better than standard analog, but it's not as good as HDTV.

Q What is the difference between "integrated HDTV" and "HDTV-ready?"

A Most HDTV sets sold today are marketed as "HDTV-ready." That means they can display HD resolution signals; they include advanced video processors and they provide the correct inputs for connecting high-definition tuners. These sets allow people the freedom to choose the kind of HD tuner – satellite, cable or terrestrial - they want to use to receive their HDTV signals.

Integrated HDTVs (also called simply HDTVs or HDTV sets) are the same as the TVs described above, except that they include a built-in high-definition tuner. Depending on the TV and manufacturer, the tuner may be compatible with off-air ATSC broadcasts, cable signals or satellite broadcasts.

Q What equipment do my customers need to receive HD programming?

A They will need an HDTV-ready television and an HDTV set-top box tuner (either for off-air, cable or satellite programming), or an integrated HDTV that includes a built-in tuner that may receive off-air (ATSC signal), cable (QAM signal), satellite signals or some combination of the three. If your equipment includes an HDTV-ready set and a set-top box tuner, you must be sure to have the proper cables to connect the equipment – usually component or DVI cables.

Q Can my customers get HDTV from the local cable company?

A In many cases, yes they can. At this time, cable providers in many metropolitan areas offer HDTV. Most of them require the use of an external set-top box, available from the cable provider, or in some instances you can provide it at retail. Most HDTV cable services require that the household be a subscriber to digital cable services. High-definition programming available from cable companies can include local affiliates of major networks, premium channels such as Showtime and HBO and special channels like Discovery, ESPN and HDNet.

Frequently asked questions about HDTV

definition. Most of them require the use of external set-top-boxes, available from cable providers, and require that households subscribe to digital cable services. By the end of the year, you will be able to purchase high-definition cable-ready TVs that include a "plug-n-play" CableCard supplied by your local provider. CableCards bypass the need for a set-top box and provide direct access to your premium cable services. HD cable programming can include local affiliates of major networks, premium channels, such as HBO, HDTV and ESPN HD, as well as special channels like HDNet.

Q What HDTV resolution is better, 720 progressive or 1,080 interlaced?

A Neither. While experts and videophiles may disagree, most people can't tell the difference. Which looks better on a particular TV depends more on the performance of the TV's built-in video processor and its scaler than the native resolution of the programming.

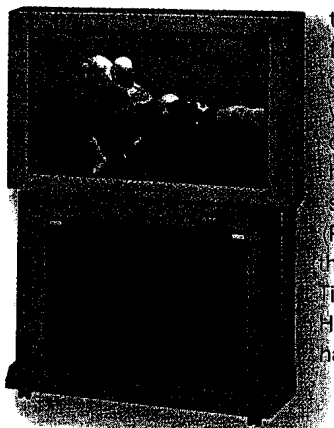
Q How much HD programming is available?

A A lot. There are HDTV programs for all tastes, from movies and documentaries to sports and sitcoms. Programming is available from local broadcasters, cable providers and satellite providers. Currently, there are at least 200 hours of HDTV available per week, including 70 hours of free, over-the-air programming from the major networks.

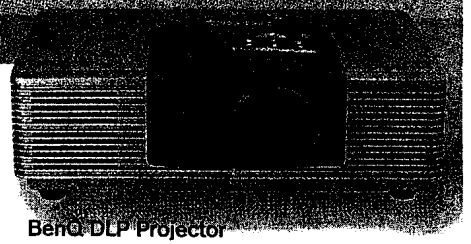
Q Can I record HDTV?

A Yes, but due to the very high resolution and large file sizes, there are only a few devices currently available for recording HDTV. Digital high-definition VCRs available from JVC, Marantz and Mitsubishi record HDTV onto digital VHS tapes in much the same way as standard VCRs. These D-VHS machines do not contain HD tuners and must be connected to compatible tuners. You should consult the dealer or manufacturer to find the combination that fits your needs. The other option is a high-definition personal video recorder (PVR) that, in much the same way as a TiVo device, records HDTV onto a built-in hard drive.

Panasonic 42-inch direct view



HDTV Shopping



BenQ DLP Projector

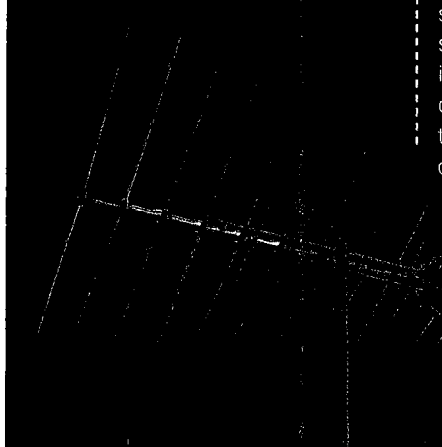
HDTVs are loaded with advanced features that weren't available in the analog days. Here are a few key features to look for and why. Many of these features go under different names depending on the manufacturer.

Size: Because of the near absence of scan lines and the tiny size of the pixels, you can generally view a larger HDTV from the same distance you would a smaller analog one. A good rule of thumb is to sit no closer than three times the screen height of the TV. Measure the seating distance in your home, and then look at a few TVs in stores from that distance.

RCA 52-inch Scenium

HDTV Tuner: Do you want to receive HDTV programming right

Accessories



Antennas. Unless you get your HDTV from your cable provider, you'll need some sort of antenna. They come in all shapes and sizes. If you want HDTV from satellite, you'll need a dish, which is a specific kind of antenna designed to capture signals transmitted from space. HDTV dishes are slightly larger than standard-definition dishes. In most cases the dish will be provided by your system installer. If you plan on getting HD signals from local over-the-air

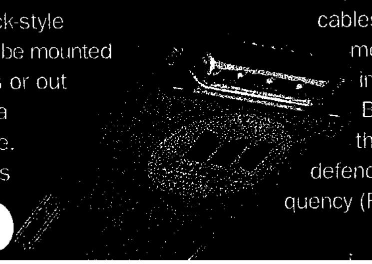
- **Ask the right questions.** Where do you watch TV? What kinds of programs do you watch? How big is your room? These questions will help you determine the best products to show the customer and what kind of demonstration material to have on hand.
- **Use good signal distribution.**Good signal distribution makes a huge difference in the quality of the picture and the customer experience. Also, easy signal switching allows you to demonstrate multible sources appropriate to the customer.
- **Use appropriate lighting.** Keeping the lighting subdued will improve the contrast and black levels of TVs.
- **Use lifestyle settings.** Rather than line up products in a row, create vinegettes with seating and furniture.
- **Stay current with HDTV news.** Nothing turns off a knowledgeable customer more than a sales person who doesn't know how to answer questions or answers them wrong.

Philips CINEOS LCoS display

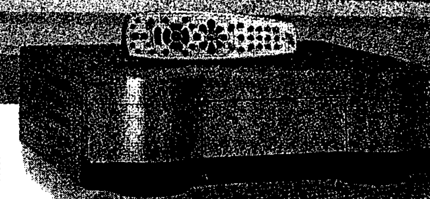
- **Don't forget the sound.** Demonstrations that combine HDTV video with Dolby Digital surround sound will wow customers and

larger than standard definition dishes. Customers who wish to receive HDTV from free local over-the-air broadcasts, will need an antenna capable of receiving UHF signals. Depending on the location, they may be able to use simple indoor antennas costing under $20, or may require a roof-mounted Yagi-type antenna. Several manufacturers offer slim stick-style antennas that can be mounted discreetly indoors or out on a wall, under a windowsill or eave. Roof-top antennas can often be effectively mounted inside attics. Consult www.antennaweb.org for assistance in picking the right antenna.

Cables. Remind your customers that the quality of the digital TV picture is greatly affected by the quality of the cable they use. Rarely do TV set-top boxes ship with quality cables, so a good investment in cables yeilds immediate benefits. Better cables have thicker insulation to defend against radio frequency (RF) interference and



HDTV Selling



JVC DISH Network HDTV Receiver and PVR

open opportunities for sales of receivers and loudspeakers.

Features: HDTVs are loaded with advanced features that weren't available in the analog days. Here are a few key features to demonstrate to your customer.

Aspect ratio control: Because not every program is going to be the same picture shape, you may want to change it to fit the TV and suit your tastes.

Color temperatures: Most TVs have selectable color temperatures. This controls the color temperature of white, which affects the color quality of the entire picture. Ideally, TVs should be calibrated to a color temperature of 65K (Kelvin).

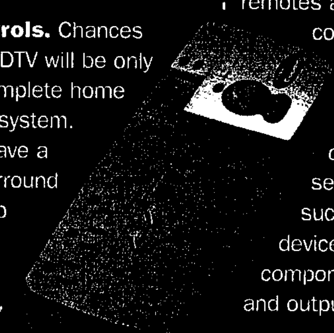
Some TVs have a setting that approximates this, but it is rarely the TV's default setting.

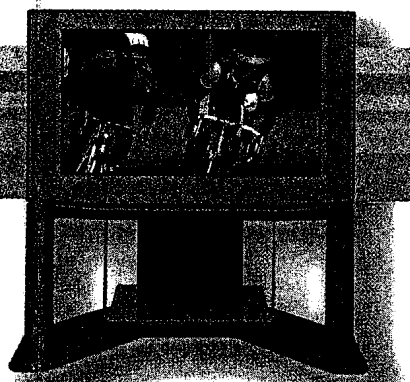
Black level enhancement: This goes under many names, but

Runco 50 inch Plasma

electromagnetic (EM) interference, which can degrade picture and sound quality. Better cables have greater integrity over longer lengths, allowing more freedom in room and system layout.

Remote Controls. Chances are that your HDTV will be only part of your complete home entertainment system. You probably have a DVD player, surround sound or stereo receiver, cable set-top box, VCR, CD player, maybe a TiVo and a video game console. You probably also have half a dozen device remotes on a coffee table, and only one member of the family knows what all of them do. Universal learning remotes are available that can combine the functions of all those remotes into one, and do tricks called Macros, in which one button press can do several functions at once, such as turn on multiple devices while switching the components to the correct inputs and outputs. Some universal





Sony 34-inch direct view HDTV

basically it allows to TV do display deeper blacks, giving you an overall richer picture.

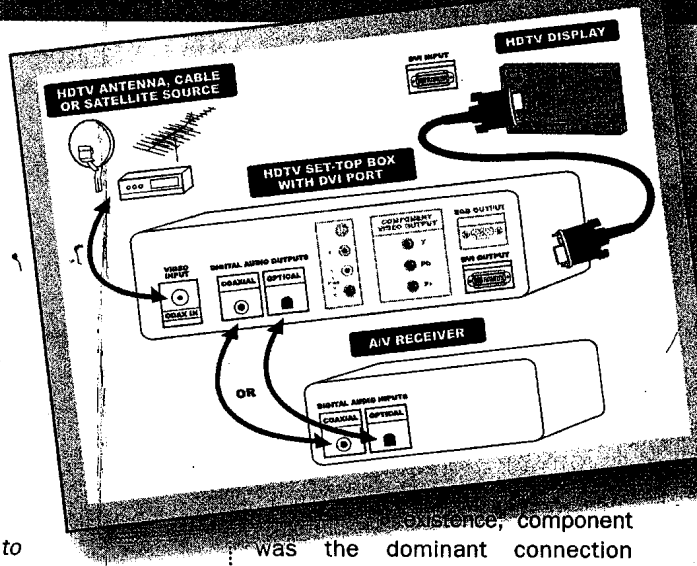
De-interlacer: This feature takes a standard interlaced video signal made of two frames and combines them so that the TV displays them progressively, all video lines shown at once. De-interlacing upconverts analog signals to a higher-quality resolution for your TV. Often this feature is used in conjunction with 3:2 pulldown which corrects an error commonly introduced in the process of converting film to video.

Input/outputs: Most customers will need at least one set of component inputs for a DVD player, an input for an HDTV tuner (either component or DVI), plus some other composite and S-video inputs for VCRs, video game machines and camcorders. Front inputs are also helpful for camcorders and game consoles.

Advanced Audio: Many TVs come with advanced audio circuitry to give you a better audio experience. Various virtual surround sound and three-dimensional sound processes offer the sonic illusion of surround sound if a full five-speaker surround sound system is not practical for your room. Some TVs even feature built-in subwoofers for better reproduction of special effects.

remotes work by enabling built-in device codes, while others can be taught the functions of your existing remotes simply by pointing them at each other and following a few simple commands.

Power Enhancement. Many consumers don't think of powerline accessories until after their TVs have been damaged by power irregularities. Power source products for home entertainment come in two forms: those meant to protect your equipment from damage as a result of electrical surges and spikes, and those meant to "clean" or improve the quality of the AC your equipment is using. Many products now perform both tasks to varying degrees. Simple surge protectors are the least you suggest to buyers of HDTVs. Consumers who want to get the highest-quality results out of their purchases, should consider products that also help regulate the voltage, and clean and enhance the electrical current feeding your gear.

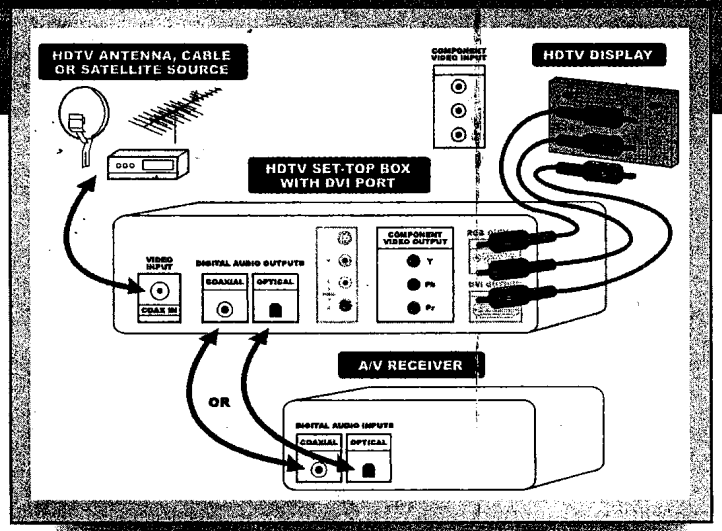


At this point in the development of HDTV, setting up and connecting your new TV isn't quite as simple as setting up a standard analog TV. On the other hand, setting up an HDTV isn't that much more demanding than connecting a TV to a standard satellite or cable set-top box.

Unless you have an HDTV with a built-in ATSC tuner, you'll need some sort of external set-top box to receive and decode the signals. HDTVs have more kinds of connections than analog TVs. The new connections, or jacks, are able to better handle the robust data streams of HDTV, and often include copy protection mechanisms to keep people from bootlegging broadcasted content. The following is a breakdown of the most common connections and their uses for HDTV.

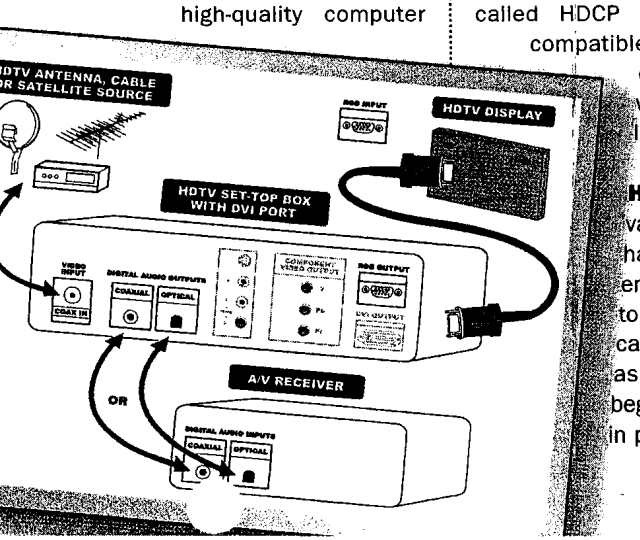
Component. This connection is actually three RCA cables — red, blue and green — that carry the HDTV signal in an analog form after it has been converted inside the set-top box. For the first few years of HDTV's existence, component was the dominant connection between set-top box and TV. It's still pretty common, with most of the HDTV cable boxes out there still sporting component outputs. In order to use component connections, you must make sure the component input on your television is able to accept a high bandwidth signal, sometimes called HD component or high-pass component.

IEEE 1394. Also called FireWire or i.Link, a 1394 cable transmits a compressed MPEG-2 signal from the set-top box to the TV. In order to work, the TV must have an MPEG-2 decoder built-in. The 1394 can be designed as a one-way or two-way connection. Two-way connections allow communication between devices, so, for example, your TV can send commands to your set-top box. A 1394 is also used for connecting to recording devices, such as a high-definition VCR.



VGA. This is the same 15-pin jack used to connect PCs to computer monitors. Sometimes it's referred to as RGB, because it carries the video signal in as three separate color signals (red, blue and green). Like component, this is an analog connection, but unlike component, it only features one cable.

DVI. Like VGA, DVI had its origins in the PC world for digitally connecting high-quality computer video outputs to PC monitors. DVI carries a very large, uncompressed digital signal. Because it is uncompressed, the signal is nearly impossible to record with currently available products. Because the signal remains digital from set-top box to TV, there are no opportunities for analog conversion errors to be introduced in the signal, ensuring a pristine picture. DVI inputs may include a copy protection scheme called HDCP which works with compatible set-top-boxes to ensure compliance with HDTV copyright laws.



HDMI. This is a variation of DVI, but has an easier-to-use end connector (similar to a USB cable) and carries audio as well as video. HDMI will begin to be introduced in products in 2004.

What's on HDTV

HDTV is available via antenna, cable and satellite. Free over-the air HDTV is available to all of the top 100 television markets in the U.S., accounting for more than 98 percent of U.S. households. Almost 80 percent of the 106 million U.S. TV households reside in markets where five or more broadcasters send out free over-the-air digital signals (source: NAB). Major cable TV providers, including Time Warner, Comcast, Cox, Insight, Charter, Cablevision and Armstrong all offer high-definition services. Satellite TV services, including Echo-star (DISH Network) and DIRECTV, are available anywhere in the country with clear line of sight to the satellites in the southern sky. Both satellite companies offer several HDTV options, including pay-per-view movies.

Over-the-Air Broadcast

While the rollout of high-definition programming started a bit slowly, options have expanded. The major commercial networks (ABC, NBC, CBS and WB) offer about 50 hours of HDTV each week. FOX has been broadcasting in 480p enhanced definition, but will switch over to HD later this year. Most primetime dramas and sitcoms are broadcast in HDTV, as well as *ABC Saturday Night at the Movies*, *CBS Sunday Movies*, and ABC's *Wonderful World of Disney*. HDTV isn't just about sitcoms and movies, though. CBS's popular daytime soap *The Young and the Restless* has been broadcast in HDTV for a year now. You'll also find a lot of sports in HD, including NCAA college football and basketball, golf, tennis, the Stanley Cup, the NFL playoffs, the NBA finals and, of course, the Super Bowl. PBS also offers several specials in HDTV. Depending on your local cable provider, all of this high-definition programming is available free with an ATSC tuner and antenna.

Cable and Satellite

Cable and satellite companies offer a well-rounded mixed bag of HDTV, including HDNet (two channels of sports and movies), Discovery HD Theater, ESPN HD, Showtime HDTV and Bravo HD. Exactly which of these channels is available from your cable or satellite company differs from region to region.

Dishnetwork offers it's HD Pak for $9.99 (in addition to regular service) and includes ESPN HD, Discovery HD Theater, HDNet, HDNet Movies, HBO and Showtime HDTV, CBS HD and high-definition pay-per-view. DIRECTV's HD package, for $10.99 a month, offers the same channel line-up except for the high-definition CBS channel.

Early next year, a new satellite service called Voom, offered by Rainbow DBS, will begin broadcasting 21 HD channels and expects to increase to about 80 channels by the end of the year. Among the 21 initial channels offered will be 10 movie channels, and several sports channels, food,

		ABC	CBS	NBC	WB
Monday	8:00 p.m.		Yes, Dear		
	8:30 p.m.		Still Standing		
	9:00 p.m.	Monday Night Football	Everybody Loves Raymond	Las Vegas	Everwood
	9:30 p.m.		Two and a Half Men		
	10:00 p.m.		CSI: Miami	Third Watch	
	11:30 p.m.			Tonight Show	
Tuesday	8:00 p.m.	8 Simple Rules...	Navy NCIS	Whoopi	Gilmore Girls
	8:30 p.m.	I'm with Her		Happy Family	
	9:00 p.m.	According to Jim	Guardian	Frasier	One Tree Hill
	9:30 p.m.	Less than Perfect			
	10:00 p.m.	NYPD Blue	Judging Amy	Law & Order: SVU	
	11:30 p.m.			Tonight Show	
Wednesday	8:00 p.m.	My Wife and Kids		Ed	Smallville
	8:30 p.m.	It's All Relative			
	9:00 p.m.		King of Queens	West Wing	Angel
	9:30 p.m.		Becker		
	10:00 p.m.	Karen Sisco	Brotherhood of Poland, NH	Law & Order	
	11:30 p.m.			Tonight Show	
Thursday	8:00 p.m.	Threat Matrix			Run of the House
	9:00 p.m.		CSI		
	9:30 p.m.			Coupling	
	10:00 p.m.		Without a Trace	ER	
	11:30 p.m.			Tonight Show	
Friday	8:00 p.m.	George Lopez	Joan of Arcadia	Miss Match	Reba
	8:30 p.m.	Married to the Kellys			
	9:00 p.m.	Hope & Faith	JAG		Like Family
	9:30 p.m.	Life with Bonnie			
	10:00 p.m.		The Handler	Boomtown	All About the Andersons
	11:30 p.m.			Tonight Show	

Typical weekly prime time HDTV program schedule (courtesy of Titan TV)

fashion and music channels, a HD Playboy channel and other special interest channels such as cartoons, collectibles and art.

You can find details online about what your local cable company offers in HD programming.

D-Theater and HD DVD

In addition to the HDTV programming coming in from your antenna, satellite or cable box, you can also view pre-recorded HDTV movies in a format called D-Theater. These digital videotapes can be played on D-Theater compatible high-definition VCRs from manufacturer such as JVC and Marantz. The selection currently only covers less than 100 titles, but more are expected in outstanding quality. High-definition DVDs, most likely in a format called BluRay, are also anticipated in the next several years. In the meantime, you can enjoy 480p widescreen DVD content better than ever before on your HDTV.

CRUTCHFIELD
The Electronic Shopping Alternative

3-2 pulldown processing

Sophisticated video processing common to digital TVs and progressive-scan DVD players. It corrects for artifacts and distortion that occur when film-based material (at 24 frames per second) is converted to video (30 frames per second), then de-interlaced to create a progressive-scan signal.

Anamorphic video

Video images that have been "squeezed" to fit a video frame when stored on DVD. These images must be expanded (unsqueezed) by the display device. An increasing number of TVs employ either a screen with 16:9 aspect ratio, or some type of "enhanced-for-widescreen" viewing mode, so that anamorphic and other widescreen material can be viewed in its proper proportions. When anamorphic video is displayed on a typical TV with 4:3 screen size, the images will appear unnaturally tall and narrow.

Comb filter

A comb filter's task is to remove residual chrominance (color) information from the luminance (brightness) signal. Comb filtering enhances fine detail, cleans up image outlines, and eliminates most extraneous colors. Comb filters are not required and not used with S-video or component video connections since those connections carry the chrominance and luminance information separately. There are four types of comb filters found in today's TVs:

- GLASS - may also be referred to as an "analog" comb filter.
- TWO-LINE DIGITAL - compares consecutive scan lines within one field of video and makes adjustments to reduce cross-color interference.
- THREE-LINE DIGITAL - compares three scan lines within a field of video. By comparing more picture information, a three-line filter further reduces color bleeding and dot crawl.
- 3D DIGITAL - not only analyzes consecutive scanning lines within a field, but also analyzes the preceding and following fields. This results in improved color purity and a more stable video image, and nearly eliminates dot crawl and color bleeding. Also called 3D Y/C.

De-interlacing

The process of converting an interlaced-scan video signal (where each frame is split into two sequential fields) to a progressive-scan signal (where each frame remains whole). De-interlacers are found in digital TVs and progressive-scan DVD players. A more advanced de-interlacer includes a feature called 3-2 pulldown processing. De-interlacing is often referred to as "line-doubling" or "upconversion."

Pan-and-scan

The process of transferring a movie or other source material to videocassette, DVD, or broadcast so that it fits the 4:3 aspect ratio of the NTSC system, as well as most current TVs. This results in a significant amount of lost picture information, particularly in the width of the image.

Pixel

Short for "picture element." The smallest bit of data in a video image. The smaller the size of the pixels in an image, the greater the resolution.

Resolution

The sharpness of a video image, signal or display, generally described either in terms of "lines of resolution" or pixels. The resolution you see depends on two factors: the resolution of your display and the resolution of the video signal. Since video images are always rectangular, there is both horizontal resolution and vertical resolution to consider.

HDTV UPDATES

HDTV

Turn It On

FOR RELEASE

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"DIGITAL CABLE READY" HDTV MARKS MAJOR MILESTONE IN DIGITAL TELEVISION TRANSITION

NEW "PLUG-AND-PLAY" HDTV SETS FURTHER EXPAND ARRAY OF DTV TUNING DEVICES AVAILABLE TO CONSUMERS

Arlington, Va., July 1, 2004 – Marking a major milestone in the transition to digital television (DTV), the Consumer Electronics Association (CEA) today celebrated the official launch of the national "plug-and-play" digital cable standard that will deliver digital and high-definition television (HDTV) via cable for the first time without the need for a cable set-top box.

The new standard, already built into scores of digital HDTV models now coming into stores and catalog retailers from multiple TV manufacturers, gives millions of cable subscribers direct access to their local cable operator's digital basic, premium and subscription program services by directly connecting their digital cable into the DTV.

Under Federal Communications Commission (FCC) regulations that take effect today, consumers across the country can now enjoy the benefits of digital cable ready products as cable operators make "CableCARD" security modules available to allow customers to receive HDTV programming without a set-top box. Like a key, the CableCARD is inserted into a slot in a digital cable ready product – HDTVs, recorders, computers, and soon other consumer electronics – to unlock a local cable system's 'conditional access' security protecting its programming.

"Plug-and-play is as simple as 1-2-3 – buy it, plug it in, turn it on and enjoy the wonders of HDTV – thanks to digital cable ready HDTV," said CEA President and CEO Gary Shapiro. "Millions of cable subscribers nationwide now have an easier path to join the HDTV revolution. Consumers who love their cable programs will love the ease and simplicity of CableCARD, and they will want their CableCARDs from their local cable operator in a timely manner and at little or no cost. Subscribers or those who want to sign up for digital cable can call their local cable operator for their CableCARD, or use the cable industry's website, www.cpss.go2broadband.com, to get more information."

The cable industry reports that half—approximately 35 million – of all cable subscribers do not use a set-top box today, relying instead on their analog cable ready TVs to receive a limited number of analog channels. In addition, millions more have second, third and sometimes more TVs in their homes, which also do not have cable set-top boxes. While none of these cable homes today can access digital cable programming, the new CableCARD can give

them first-time access to digital and HDTV on cable.

CEA reports that 54 percent of consumers surveyed said they would be more likely to buy HDTV if a separate set-top box was not required. Digital cable ready products allow these customers to move seamlessly into the digital world, enjoying all that HDTV has to offer through the cable connected directly to the back of their digital cable ready HDTV.

"The DTV transition goes into high-gear today, considering that 70 million U.S. households rely on cable for their primary TV reception," Shapiro continued. "Digital cable ready HDTVs offer cable consumers a variety of features and benefits, including access to premium services and, in many cases, program guide capabilities built right into the new HDTVs.

"Not only do they offer cable DTV reception," Shapiro said, "they include an ATSC tuner for off-air DTV reception, as well, further advancing the analog to DTV transition. For its part, the consumer electronics industry is committed to working with retailers and cable operators to ensure that consumers understand and have access to CableCARDS to receive HDTV and other premium cable programming without a set-top box."

CEA noted that consumers enjoy a broad array of options when it comes to receiving digital and HDTV programming. Eighty-one models of integrated HDTV sets (with ATSC broadcast tuners built-in) currently are on the market, compared to only 34 one year ago; and 12 of these integrated sets today also are digital cable ready products—with more models set to appear in the weeks ahead. Additionally, consumers may choose to buy one of the 25 DTV set-top box models for over-the-air or satellite reception, or one of the growing number of PC tuner card options for DTV reception. CEA has announced it expects some one million digital cable ready televisions to be sold by the end of this year.

"The bottom line is that the consumer electronics industry is committed to HDTV and driving the nation's analog to digital transition forward," said Shapiro. "Integrated products will continue to proliferate, with built-in digital broadcast and cable reception. But whether consumers want to receive HDTV and digital programming through cable, satellite or a broadcast antenna, using a set-top box or the all-in-one integrated solution, they have an abundance of choices in the marketplace today. We look forward to continuing to respond to consumers' enthusiasm for HDTV and offering even more product choices and features going forward with the help of all involved in the DTV transition."

About CEA:

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the consumer technology industry through technology policy, events, research, promotion and the fostering of business and strategic relationships. CEA represents more than 1,500 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $85 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

DIGITAL CABLE READY HDTV MARKS MILESTONE IN DTV TRANSITION/2

CEA also sponsors and manages the International CES – Defining Technology's Future. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

UPCOMING EVENTS

- **CEA 2004 Summer Technology & Standards Forum**
  August 2-6, 2004, Coronado, CA
- **CEA Industry Forum**
  October 18-20, 2004, San Francisco, CA
- **Electronic House Expo – Spring**
  November 15-18, 2004, Long Beach, CA
- **International CES – Defining Tomorrow's Technology**
  January 6-9, 2005, Las Vegas, NV

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HDTV

Turn It On

FOR RELEASE

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CEA PROJECTS ONE MILLION 'DIGITAL CABLE READY' HDTVs WILL BE IN HOME BY YEAR'S END

CE INDUSTRY ACTIVELY ENGAGED IN CONSUMER EDUCATION ABOUT PLUG-AND-PLAY SETS AND CABLECARD

Arlington, Va., May 18, 2004 - Beginning this summer, American consumers for the first time will be able to receive digital high-definition television (HDTV) programming via cable without the need for a set-top box. In fact, the Consumer Electronics Association (CEA) announced today that by year's end, more than one million so-called "Digital Cable Ready" (DCR) HDTVs are expected to be sold in the United States.

Under terms of the landmark cable-consumer electronics "plug-and-play" DCR agreement, ratified last fall by the Federal Communications Commission, CEA officially notified Cable Television Laboratories Inc. (CableLabs) today that more than a half million Digital Cable Ready HDTVs are expected to be on the market through Sept. 30, with more than a million HD sets and cable subscribers needing a CableCARD by the holiday season. That same number of CableCARDs will be needed to support the rollout of the dual ATSC-cable tuner integrated television sets. Coupled with a positive fourth-quarter forecast, this means explosive growth, eclipsing a million units in just six or seven months, according to CEA Director of Industry Analysis Sean Wargo.

"The extraordinary forecast represents DTV manufacturers' rollout of integrated products having both ATSC tuners for off-air reception and cable tuners for digital cable reception," said Wargo. "We're bullish about DTV in 2004 – particularly Digital Cable Ready HDTVs – which consumers will easily identify by their distinct 'DCR' logo. With July 1, 2004 signifying the start of the FCC's requirement for large-screen TVs with built-in off-air DTV tuners and the CableCARD implementation date, DTV manufacturers are working to provide American consumers DTV products that suit their reception needs."

CEA has been preparing consumers for the introduction of Digital Cable Ready HDTVs since early this year. Print materials and an educational video have been distributed widely through consumer events, trade shows and media partners. In addition, a satellite media tour in March reached more than five million consumers in 15 markets with information about Digital

-more-

Cable Ready HDTVs and the CableCARD. A CableCARD is the security card required from the cable provider in order for consumers to enjoy any encrypted programming or premium services.

CableCARDs are to be available directly from operators beginning July 1 - the date by which cable multiple system operators (MSOs) with digital systems (of 750Mhz) are required to support FCC-endorsed Digital Cable Ready standards.

"With hundreds of thousands of CableCARDs needed before football season gets underway, we presume that cable operators have ordered sufficient quantity of the new cards to insure that HDTV buyers will be able to get the cards they will need to become cable HDTV subscribers," commented CEA President and CEO Gary Shapiro. "Receiving HDTV over cable without a set-top box is a long-awaited driver of the DTV transition and will provide millions of households with a seamless transition to high-def. It is important to note that Digital Cable Ready HDTVs also include over-the-air DTV tuners for terrestrial DTV broadcasts from more than 1,200 DTV stations and feature a secure digital interface to insure easy connection to high-definition services offered by satellite operators. Now, HDTV is virtually at your fingertips no matter how you receive your TV signal."

About CEA:

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the consumer technology industry through technology policy, events, research, promotion and the fostering of business and strategic relationships. CEA represents more than 1,500 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $90 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

CEA also sponsors and manages the International CES – Defining Tomorrow's Technology. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

UPCOMING EVENTS

- **Consumer Electronics CEO Summit**
  June 23-26, 2004, Huntington Beach, CA
- **CEA 2004 Summer Technology & Standards Forum**
  August 2-6, 2004, Coronado, CA
- **CEA Industry Forum**
  October 18-20, 2004, San Francisco, CA
- **Electronic House Expo – Spring**
  November 15-18, 2004, Long Beach, CA
- **International CES – Defining Tomorrow's Technology**
  January 6-9, 2005, Las Vegas, NV

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